

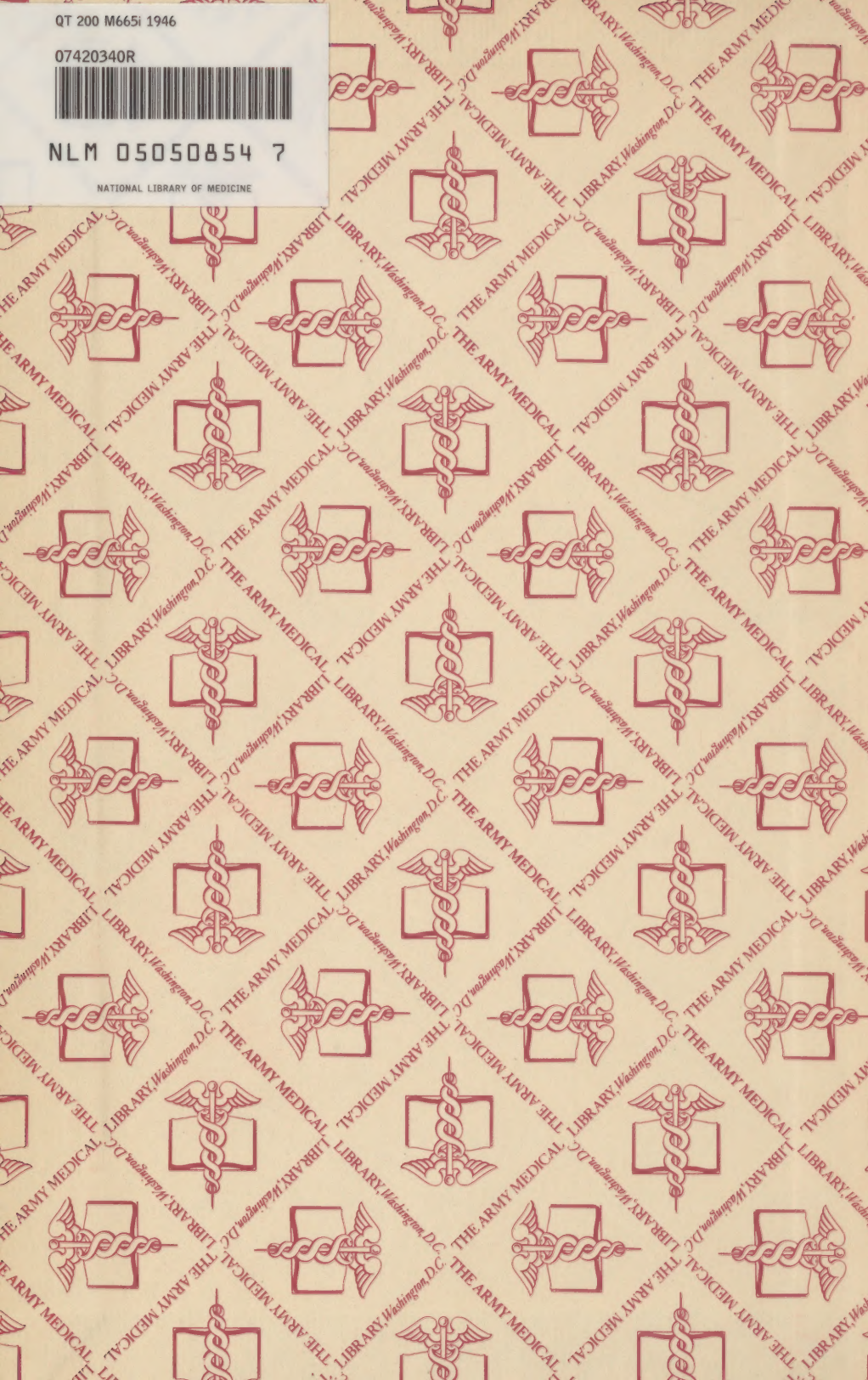
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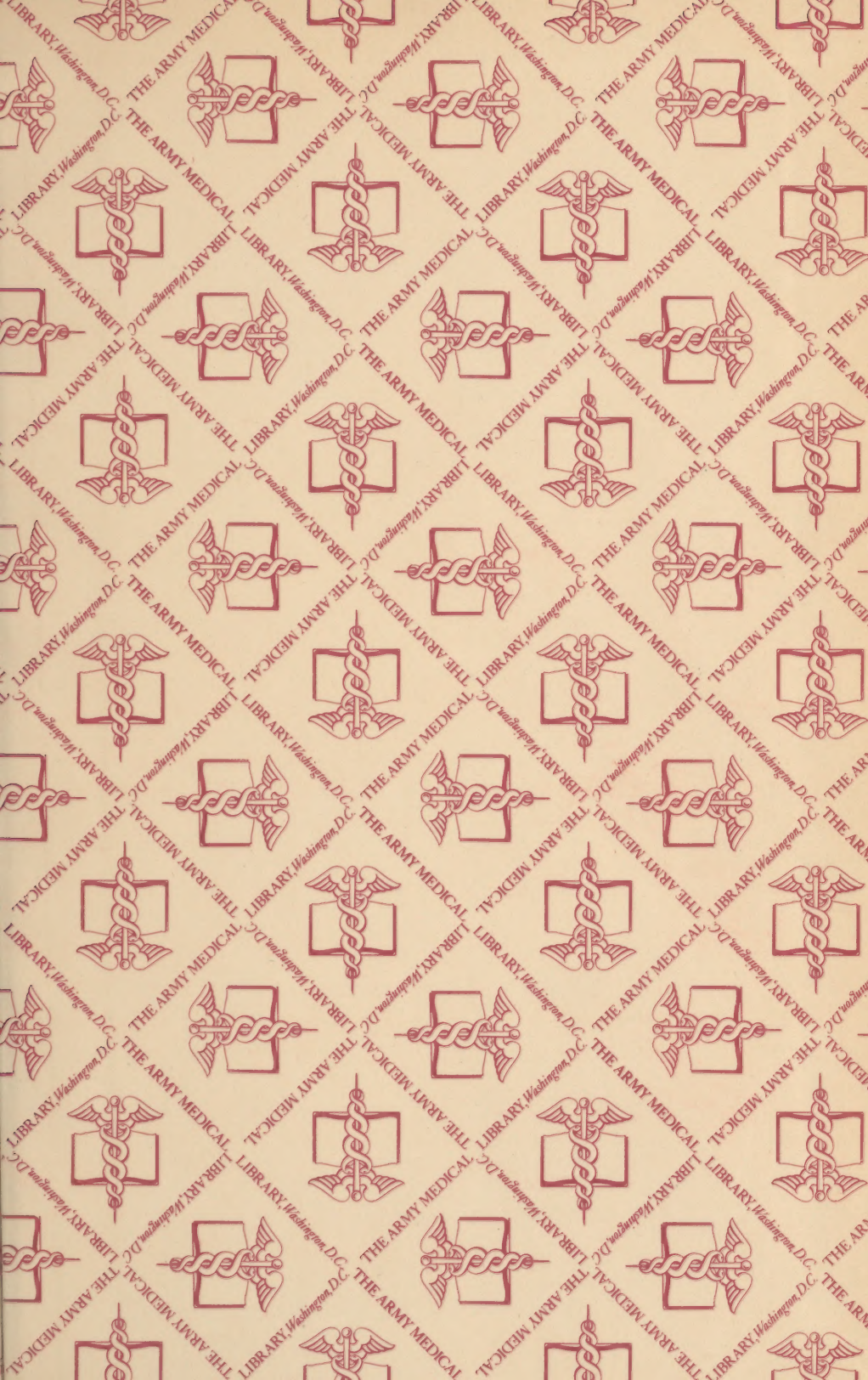
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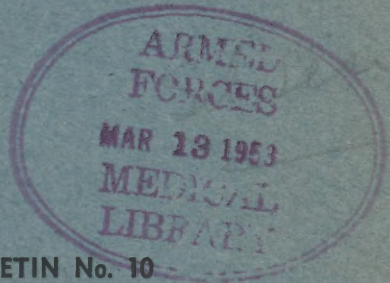


INDIVIDUAL AND COMMUNITY HEALTH

EFFICIENCY FOR LIVING

JUNIOR HIGH SCHOOL

HEALTH and SAFETY EDUCATION



CURRICULUM BULLETIN No. 10

STATE OF MINNESOTA
DEPARTMENT OF EDUCATION
1946

Property of School Dist. No. _____

County _____

Minnesota

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JUNIOR HIGH SCHOOL

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**STATE OF MINNESOTA
DEPARTMENT OF EDUCATION
1946**

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INTRODUCTION

GENERAL STATEMENT CONCERNING THE OBJECTIVES FOR THE HEALTH AND SAFETY EDUCATION PROGRAM

General

The health, safety and physical welfare of every school pupil is a primary purpose of modern education. There is widespread acceptance of the belief that the school must provide a program which helps the pupil to develop a sound body, wholesome mental attitudes and controlled emotional reactions. Any plan adopted by the school which does not provide opportunity for the fullest development of the high school pupil so that he may achieve all of his potentialities, may be said to limit normal growth. The school should take the lead in formulating and promoting a program devoted to all phases of personal health and individual development. The acceptance of such a responsibility supports the present-day emphasis upon the individual and his place in society, rather than upon subject matter alone. It is, therefore, the purpose of this course of study to provide guidance to schools in establishing programs utilizing the numerous teaching opportunities which exist. The course incorporates a variety of experiences in lifelike situations through which the pupil may develop attitudes, habits and principles of living which will make him a more happy, healthy and worth-while citizen.

Many agencies other than the school are actively influencing the health and well-being of the school pupil. In shaping the school program, each teacher should know the contributions of these agencies and use them in developing a functional program which reaches into the community. A truly effective school health and safety program makes its influence felt in the community, and particularly in the home. Community cooperation is a key concept in the development of this program.

Health instruction should occur at all grade levels because youth has particular needs at each stage of growth and development. The period of youth offers special opportunities to carry on health training and to solve health problems which otherwise might persist throughout life. Youth is the period when the foundation is laid for good health.

Safety instruction, likewise, should occur during the high school years because youth and adults are constantly faced with the problem of accident prevention. Education for adequate health and acquisition of a positive attitude regarding the necessity of accident prevention are closely coupled in any sound program of health education. One cannot be attained without the other. The health one achieves or acquires is of little value if a life is "snuffed" out as a result of an accident or if the individual is handicapped by injury. The economic loss to the world and to the individual himself caused by accidents is reason enough for a sound program of safety education. Thus safety is an integrated and necessary part of the total health instructional program.

Specific Objectives

The course is designed to emphasize certain objectives. It is suggested that teachers constantly keep these objectives in mind so that the outcomes of class discussion, class assignments, and functional projects are all directed toward ability to:

1. Appreciate that to maintain good health, skill in practicing health habits is essential and health cannot be maintained or achieved without putting into practice the knowledge that has been acquired.
2. Appreciate good health as an essential from an economic point of view.
3. Realize that good physical and mental health are necessary if one is to build and maintain adequate defenses against disease.
4. Recognize health as a joint responsibility of the individual and the community.
5. Achieve community understanding and participation in health which results in a better school and community in which to live.
6. Acquire a knowledge, an understanding and desirable attitude of safe procedures on the highway, at work, in the home, in school and in recreation.

Teachers are advised to refer to Curriculum Bulletin No. 1, "A Guide for Better Instruction in Minnesota Schools," for a statement relating to the general philosophy of the educational program for Minnesota schools and for the development of units and use of curriculum materials.

GENERAL SUGGESTIONS FOR UTILIZING THE COURSE MATERIAL IN HEALTH AND SAFETY

It is recommended that the teacher make a survey of pupil health needs at the very beginning of the school year. Careful analysis of cumulative health record cards and results of the various attempts to appraise the health status of the pupils through examinations, inspections, observations, tests, etc., will be helpful in determining their health needs. The survey might also include discussions and tests in order to determine the health habits, attitudes, interests, appreciations, and knowledge of the pupils. Following this the specific approach to be made in the direction of evolving unit studies can be determined. When health needs, health behaviors, and health responsibilities are seriously considered, it follows that cooperative planning of teacher and pupil must take into consideration individual differences among pupils.

Relation to Elementary and Senior High School Courses

In the junior high school the health teacher should be thoroughly familiar with the elementary course in health education, Curriculum Bulletin No. 2, Code VIII-A-E-1, and the senior high school course of study, Curriculum Bulletin No. 14, Code VIII-B-6. In dealing with subject matter in the junior high school the emphasis is placed upon the pupil obtaining certain factual information which can be used in day to day living. A background of basic information built upon material covering the elementary and the junior high school years should provide an opportunity for intelligent interpretation of community and personal health problems. Therefore, any instruction to be truly effective must be organized so that there is a sound continuity of work experience and standard of achievement from that which has been included in the elementary curriculum to the material outlined in the junior high school course. The teachers of junior high school pupils are advised to confine their health instruction to the suggested content to avoid unnecessary overlapping with the material covered in the senior high school.

Adaptation of Course of Study to Various Teaching Plans

Note: See pages 21 and 22 for description of all plans for teaching health.

Plan A. If the teacher is to teach health on the Plan A basis (five periods per week), the entire course of study, Parts 1, 2, and 3, should be used. The time allotments suggested in the units call for a total of 180 periods of class work.

Plan B. If the teacher is teaching the Plan B type of instruction (five periods per week of health and physical education), the following plan should be used:

- Grade 7: Part 1—Personal Efficiency for Living
- Grade 8: Part 2—Community Efficiency for Living
- Grade 9: Part 3—Protection Is Desirable

In those schools where grades are combined, teachers will find it necessary to teach the health course of study as a cycle program. For example: When grades seven, eight, and nine are combined in one class, teach all of Part 1 during the first year the health course is offered.

Note: Be sure to teach only Part 1 and to cover only that material in any basic textbook and supplementary texts used which is related to the material outlined in Part 1 of the course of study.

During the second year of the program Part 2 should be taught to these grades and Part 3 during the third year. Thus if grades seven, eight, and nine are combined into one class the cycle plan would require three full years to complete. By following this procedure omissions and repetition are eliminated. When two grades are combined, for example, seven and eight, teach all of Part 1 to the seventh and eighth grade group the first year the course is taught, and during the second year

teach all of Part 2. If grades nine and ten are scheduled together the material contained in Part 3 of the junior high school course, Curriculum Bulletin No. 10, Code VIII-A-7, should be taught during the first year and Part 1 of the senior high school course, Curriculum Bulletin No. 14, Code VIII-B-6, during the second year.

Plan C. If Plan C₁ is taught (five periods per week for physical education and health), the same procedure as used for Plan B may be used. If Plan C₂ (two periods per week of physical education, combined with two periods per week of health education) is used, again the same plan for direct health instruction may be used as for Plan B. If, however, Plan C₃ is used (two periods per week of physical education, combined with one period per week of health education), there is only sufficient time assigned to handle one-half of the work allocated for each part. The same assignment of parts should be followed as under Plan B. However, because of time limitation only one-half of the work can be accomplished. Therefore, the teacher must select either certain sections or certain units within the sections. For example: In grade nine the teacher may wish to select the sections on safety and first aid. If all of the work were covered in these two sections no time would be available for driver education. Or the teacher may wish to emphasize driver education, which if done would leave no time for general safety and first aid. Either plan is acceptable. The decision rests with the teacher and the school.

Plan D. In using Plan D certain selected units should be definitely assigned to subjects to be taught as health units—**not as incidental material**. The use of Plan D is not recommended and should be followed only where other types of direct health instruction are impossible to schedule.

Teaching First Aid Units

In teaching the first aid units in the course of study it is suggested that the First Aid Textbook of the American Red Cross be utilized as the basic text. Teachers who have completed the Red Cross instructor's course will observe that the material covered in that course is of value in teaching the units in first aid. Teachers who have not completed a satisfactory first aid instructor's course should explore the possibilities of receiving such specialized training.

Note: Red Cross courses include the following:

Junior First Aid Course—fifteen hours of instruction.

Standard First Aid Course—eighteen hours of instruction.

Advanced First Aid Course—twelve hours of instruction.

These three courses are conducted by local Red Cross instructors. In addition to these, there is the instructor's course of fifteen hours' work which is conducted by a national field representative of the American Red Cross. The standard, advanced, and instructor's courses may be combined and taken as a thirty hour course. This course also is conducted by a national field representative.

Driver Education

In teaching Part 3 attention is called to Section Ten, "Driver Education." Due to the tremendous annual loss of life on the highway, particular attention needs to be given those aspects of driver training and pedestrian behavior which can be incorporated in safety education. Conservation of human resources through accident prevention is fundamental. For additional information and convenient teaching materials obtain Code XIV-S-1, "Lessons in Traffic Safety," from the Minnesota Department of Education or the Minnesota Department of Highways.

Teaching About Alcohol and Narcotics

There is a legal requirement that the effects of alcohol and narcotics are to be taught to all pupils in the state. Consequently, it is called to the attention of the junior high school teacher that Part 2, Section Five, Unit XVI, contains material and information on alcohol and narcotics. The teacher should effectively present this information.

Testing

There are two types of tests which the teacher may use:

Diagnostic or pre-instruction tests are used previous to the actual teaching of the units. These tests are of value in helping the teacher to determine what factual information pupils possess and therefore enable the teacher to better plan the work of the unit. One of the quickest ways to kill interest is needless repetition. Therefore, if pupils are found to have adequate knowledge it is possible to make the necessary adjustments in the content and it logically follows that the teacher should stress the **functional** aspects of instruction.

Final or achievement tests at the conclusion of the units need to be included in the testing plan. Such tests measure the knowledge and attitudes associated with the material covered in the units. Definite concepts relating to health should be included and the tests should be sufficiently complete so that all important facts and material are covered.

Work Sheets

It is recommended that the teacher use work sheets as one means of making the program of health instruction more functional. The work sheets to be developed should not require laborious effort on the part of the pupil but should contain challenging projects which stimulate a functional approach or actual life situation or experience in healthful living on the part of the pupil. Work sheets should be developed on the contract plan.

SPECIFIC SUGGESTIONS FOR DEVELOPMENT OF UNITS AND USE OF THE COURSE OF STUDY

In developing a unit it is suggested that the following procedures be followed in order to obtain the most efficient results:

TITLE PAGE

On the title page the general **title for the section** is given as well as the **suggested time allotment**. The teacher should plan his work so that the content included in the general subject topic can be covered in the time suggested and that the work assigned to each of the units can also be completed within the suggested time. This is essential if the material in the course of study is to be covered with a proper balance and emphasis. Also listed are the specific **titles of the units**. How these units fit together into the total topic of the section should receive the attention of the teacher.

The **"OVERVIEW"** appearing on the section title page should be carefully studied by the teacher in order to obtain an over-all perspective for the section and for suggestions concerning points of emphasis in teaching the units.

BIBLIOGRAPHY

"Pupil References" under bibliography at the beginning of each section list the most common pupil textbooks suitable for use in the units. Observe that the page references for each unit within the section are given. In many cases references are given for several different places in the same book for the same unit. This information is contained in the course of study so that the teacher will have ready access to pages which will be found not only in the basic textbook but also in supplementary textbooks which should be available. The health course should be taught by unit and by section as contained within the course of study rather than following the order given in the textbook. This will aid in preventing duplication of material and serious omissions in succeeding years.

In **"Library References for Pupils,"** the teacher will note that in selected cases a few books have been listed for supplementary pupil reading. In other cases it is suggested that the school librarian be contacted. It should be pointed out that for gifted pupils and for pupils interested in exploring various aspects of the program associated with the unit or section an opportunity to utilize the additional reference materials in the library affords an excellent means of adjusting the program to meet individual differences.

The modern school library exists for the purpose of furthering the objectives of the school. It functions as a service agency, a materials center and a teaching laboratory, but to do so effectively, the health teacher, the pupils and the librarian must work together.

What are the specific contributions which the library has to make to the health and safety education program? First, the provision of enrichment materials, an essential in an area as broad as health. Second, a variety of the materials needed to care for individual differences. Third, the use of these materials as a means of correlating the health program with other activities and subjects. The librarian's knowledge of books, and of such tools as the *Children's Catalog* and the *Standard Catalogue for High School Libraries* make it possible for her to locate books when they are needed, to inform the teacher about the existence of such materials and to help the pupils make effective use of them.

The librarian can help the health and safety education program by: Providing sources of material, selected book lists, subject indexes, etc. Organizing all materials for use.

Having a knowledge of the new course of study in health and safety • education.

Keeping the teachers informed of new materials.

Locating materials for the correlation of the health program with other subjects.

Visiting the classroom to introduce library materials.

Arranging to have classes use the library as a laboratory.

The teacher can make effective use of the library in the health and safety program by:

Learning about useable materials in the library related to this field.

Keeping the librarian informed of the units from the course of study to be taught.

Planning a unit of instruction with the librarian.

Preparing the class for a laboratory period in the library.

Teaching pupils how to use the library.

"Teacher References" list technical references and books on methodology. The units for which each book is suitable are indicated. For the teacher not fully equipped with a background of health information, the use of teacher references outlined will prove of value.

"Sources of Free and Inexpensive Materials" list the specific materials as well as names of firms or agencies making such material available. The teacher will be interested to note that the unit in which such material may be used has been listed. Particular attention is called to the suggestions relative to the ordering of free and inexpensive materials given in the general bibliography at the end of the course of study.

The **"Visual Aids"** suitable for each unit within the section are listed. The use of visual aids at the proper time incorporated with proper techniques is a valuable procedure in teaching. One of the most effective teaching aids is the sound and silent moving picture. If the school has a projector, adequate use of this invaluable teaching aid should be made. Selected films on many areas of health can be obtained at a nominal cost. The school's visual aids department should become familiar with the sources of acceptable films. The ordinary slide projector offers opportunities for visual education. The pupils can make additional slides

to supplement the obtainable supply. To be most effective, films and slides should be previewed by the teacher before presentation to the health class to determine the educational value to be derived from the showing. Up-to-date, authentic films are desirable. A film of questionable educational value or an out-of-date film, for example, which pictures the characters dressed in clothing of an earlier day, may lose its effectiveness as a teaching aid. The pupils should be thoroughly familiar with the objectives of the lesson to be taught in the film prior to the showing. To fix the learning and make the teaching more effective, a review of the important points of the film should be stressed in a follow-up discussion. The film or slides should be carefully selected as to the level of maturity of the pupils participating in the study. The following four points summarize a desirable procedure for the most effective use of films: (1) preview the film, (2) tell the purpose of the film before showing it, (3) discuss the points to watch for and (4) arrange for a definite follow-up discussion and evaluation, which might include a brief test. Pictures, posters, exhibits and models may also be used to advantage in all areas of instruction.

OBJECTIVES

For each specific unit the **"OBJECTIVES"** are given. Teachers should carefully check these pupil objectives against the overview found on the title sheet of the section as well as the general objectives of the course listed in this introduction. This procedure will guide the teacher in organizing the instructional program so that the fundamental purposes of the unit as well as the general objectives of the section and the total health course of study are fully achieved and realized.

USE OF SUGGESTED ACTIVITIES—THE FUNCTIONAL APPROACH

The teacher should use a functional approach in developing the health education program. The suggested activities listed in the course of study for each unit provide the basic framework for functional activities in the program. A functional program of health is a doing program of health. It is alive and aware of the needs of the individual and the community. It is constantly changing to meet the individual differences and adjusting itself to provide adaptations to the community. It is a dynamic program—one which radiates life and enthusiasm. It locates the basic problems of the community and attempts to solve them. It is not a textbook or reference book plan of teaching alone. It reaches into the grass roots. The suggested activities listed in the course of study are pupil activities designed to implement instruction so that such instruction becomes functional. In order to facilitate the instructional program the suggested activities have been divided into three categories.

First, **"Recognize the Problem"**—that is, to suggest activities involving a functional or doing approach to instruction which will more or less localize the problem for the state, for the community, for the school, for the home or for the pupil. Such activities are usually designed to create pupil interest in some phase of the problem which applies to him

and in which he is vitally concerned and interested. For example: The community may have a very definite problem in the pasteurization of milk or in garbage or sewage disposal. These or similar problems which exist in the community should be definitely recognized and considered in the pupil experiences at the appropriate time as outlined in the course. It should be pointed out that there may be larger problems associated with each of the problems listed.

Second, **"Develop the Problem"**—that is, by means of functional activities to study the problem, to supplement information available in the textbook and reference books, to make field trips, to conduct informational surveys, to prepare special reports, to invite experts to speak to the class, etc. At this point the teacher should make considerable use of the material contained within the content of the course of study. The functional principle of learning involved in this procedure is based upon actually practicing those things about which we talk. The true success of the class in health education will depend upon how much doing or actual experience the teacher is able to initiate. It is understandable, of course, that the total amount of actual life experiences will be limited, but the functional experiences initiated about the home, the school, or the community, should provide down-to-earth opportunities for actual practice of health.

Third, **"Evaluation"**—the final outcomes of an experience program and of acquiring certain factual information should be measured and important conclusions drawn in the evaluation phase of the activity program. This should result in culminating activities which would climax the instructional program and provide the high point of the unit or the section. The true measure of success of instruction can be said to rest upon those things which have been accomplished either for the individual or the community in improving the health conditions as far as the health implications for any particular unit are concerned. Consequently, if the possibilities of a unit have been thoroughly utilized there will have been activity either on the part of an individual or the citizenry which will have resulted in improved health conditions. Finally, no course of study in health education or any specific health project can be complete without some evaluation. What has been the accomplishment of the class? What has the teacher and the pupil accomplished? What can be measured in definite concrete form? Increase in the number eating the regular school lunch; increase in the number of pupils vaccinated; increase in the number of pupils having all dental defects corrected; improvement in some phase of community sanitation; establishment of a pasteurization plant or increase in the use of pasteurized milk within the community are examples of types of outcomes to be measured by an evaluation.

For each unit there are usually several projects listed which involve considerable time and effort. It is not feasible for the school or the class in health education to attempt to work upon all of the extensive projects which involve community relations and a definite change in health behavior within the community. Consequently, it is suggested that the health class attempt two or three general projects of the time-

consuming type for emphasis during the year. These will be in addition to those which can usually be done during the class period or during the time assigned to the unit. For example: It may be advisable to establish or emphasize diphtheria and smallpox immunization. Considerable community work may be necessary. Arrangements for the immunizations coupled with school and community participation takes time. Such a project could not be finished within the time allotted to the unit. It is necessary to carry this project on through the year while other units are being studied and other activities are being worked upon. Other general projects may be a dental program, an audiometer testing program for hearing, a nutritional program or a safety program to reduce accidents.

Field trips and excursions are recommended frequently as a means of gaining knowledge of the community and of the subject being studied through observation and experience. These, however, should be planned only when the problem being studied can be enriched and clarified. To obtain satisfactory results from the field trip consideration of the following procedures is recommended:

- Identify the purpose of the excursion for the pupils by developing readiness for the experience.
- Preview the trip to gain an acquaintance with the learning opportunities it affords and to find out the problems of transportation, guide service, rest facilities, and the number of pupils who can be accommodated.
- Give the firm or agency as much advance information as possible as to what is desired by the school.
- Plan with the pupils the details for their observation and for their safe and courteous conduct.
- Give evidence of appreciation for community cooperation and thus pave the way for further contacts.
- Summarize and utilize learnings gained.

CONTENT

The section devoted to "**TERMS AND CONCEPTS**" should be utilized to guide the teacher in stressing the important parts of each unit. Definite knowledge should be acquired by the pupil concerning the term or the concept listed. Something more than association of the term to some aspect of health is needed. Definite provision should be made by the teacher for utilizing the terms and concepts through tests, class discussion, class projects, and as standards of achievement. Teachers are encouraged to be sure that pupils have complete understanding of these terms and that such terms are used intelligently.

In the "**SUGGESTED CONTENT**" the teacher will find the basic factual material which can be used in the presentation of the unit problem. The material outlined in this section provides the teacher with a guide to follow in the presentation of material and in the scope of the

material to be presented. Particular emphasis should be given to carefully checking the material contained in this part of the unit with the material contained in the textbook and supplementary textbooks. Teachers will find it necessary to introduce supplementary material in order to obtain complete coverage of information for each unit.

SCOPE OF THE HEALTH AND SAFETY EDUCATION PROGRAM

General

For the realization of the best possible program in health it is essential that there be a coordination of all possible phases of the program instrumental in promoting all-round health development of the pupil. In addition to the school program, there are agencies in the community which aid in maintaining, promoting and protecting the health of the social group. All can augment each other to the extent that cooperation exists among the personnel of the school and other health agencies, which have as their responsibility the administration of the various aspects of the health program. The goal of a health program is the best possible development of each pupil physically, mentally and emotionally.

Health Director

In all junior and senior high schools a health director is required. The health director, sometimes referred to as the health coordinator, shall be responsible to the superintendent for the complete operation of the total school health program. He should coordinate the health program which is developed in the elementary school with that of the junior and senior high school. He should work with the principals, elementary and secondary school instructors, and others associated with the health program, such as nurses, dental hygienists, doctors, dentists, lunchroom supervisors, and any agencies that have responsibilities for health. In large school systems a teacher should be designated as health director or health coordinator in each building. These teachers in turn may serve as an advisory committee to the health director for the city system. The details and functioning of the entire school health program should clear through the health director.

School Health Council

In considering the administration of any school health education program, the place and function of the health council in the operation of the program is fundamental. The health council should assist the health director to coordinate the various aspects of the school health program. It shall serve as an advisory group, and as a guide to the director rather than perform any of the specific duties. The makeup of the health council is important if an efficiently functioning group is to be maintained. A suggested organization may include:

Principal of high school or superintendent of schools, principal of elementary school, an elementary teacher, head of science department,

head of social studies department, head of home economics department, head custodian, school nurse, physician, dentist, boys' physical education teacher, girls' physical education teacher, representative from board of health unless included above, representative from student body, and member of board of education.

Note: Adjustments to fit local situations and conditions may be made relative to the makeup of the school health council. A school health council may not necessarily include all the above personnel.

The health director shall serve as chairman of the school health council. Such a procedure is desirable inasmuch as the health director has charge of the complete program.

The Health Program

The complete school health program may be divided into four distinct phases: (1) health service, (2) hygiene of the school environment, (3) hygiene of the instructional program, and (4) direct health instruction. In order to develop a well-rounded program of health education, the teacher will find it necessary to consider each of the four phases of the total school health program.

HEALTH SERVICE. The school health service program consists of those procedures which are designed to determine the health status of the pupil, to enlist his cooperation in health protection and maintenance, to inform parents of the defects that may be present, to prevent disease and to correct remediable defects. In order to safeguard the pupil's health for his own well-being and that of the group in which he works and plays, it is necessary that an efficiently organized health service be established. Specifically, the coordination of this program will be under the direction of the health director who will be assisted by the teaching force of the school. If a nurse, doctor or dentist is available, the program may become even more effective.

The effective operation of any program of instruction depends upon the health status of the pupil. This, in turn, is affected to a considerable degree by the services made available for his welfare. Furthermore, such services properly administered from an educational standpoint will aid in developing a wholesome pupil attitude for health. Numerous opportunities for direct health instruction are inherent in a health service program. Such health services might include:

Appraisal. Health examinations, dental examinations, observation, vision tests, hearing tests, posture tests, etc.

Note: For the junior and senior high school emphasis should be placed upon constant and continual observation of pupils. Such observation can be very effective if carried on by teachers with some training in the procedures to be used in pupil observation. Such a plan should replace the periodical health inspection which is usually practiced at the elementary school level.

Protective. Stimulate parents' interest in smallpox vaccinations, Mantoux tests and X-ray for tuberculosis, diphtheria immunization and other protective measures. The procedures to follow in the prevention and control of communicable diseases are: (1) notify the department of health of suspected cases, (2) isolate and send home as soon as possible pupils who seem sick, (3) encourage children to stay at home and away from other children when sick.

Remedial. The results of the appraisal of the pupil's health status may be most effectively followed up by employing the following procedures: (1) parents present at the health examinations, (2) written notice to the parents stating findings, (3) visit the home to secure cooperation, (4) request assistance of public and private agencies for homes of low economic status.

The school should also establish a policy for taking care of accidents and sudden illnesses. It is the school's responsibility to: (1) give immediate care and first aid, (2) notify the parents, (3) get pupils home, (4) guide parents where necessary to sources of further treatment, (5) provide adequate first aid equipment in each school and school bus and properly trained teachers and bus drivers for utilizing this equipment.

HYGIENE OF THE SCHOOL ENVIRONMENT. The health of the pupil is affected by the environment in which he works and plays. Maintaining a hygienic and safe environment is the direct responsibility of the school administration; however, the classroom teacher must take an active part in ascertaining that proper conditions are maintained in the classroom. A functional approach to teaching may be easily established through carefully integrating the hygiene of the environment with the instructional program. Careful attention must be paid to proper seating, sanitation, lighting, heating, ventilation and cleanliness of the schoolroom. Safety precautions, equipment and facilities all influence the health and well-being of the pupil.

HYGIENE OF THE INSTRUCTIONAL PROGRAM. The over-all instructional program has a profound effect upon the health of the pupils. In order to carry out the philosophy of the modern school, directed toward all-round development of the pupil, the health and general welfare of the individual pupil must be considered. It is important that recognition be given to the many-sided pupil-teacher-school relationships. Learning is facilitated, proper attitudes are fostered and higher ideals may be established when the pupil is in harmonious relationship with his environment. Proper emotional development of youth is a constant concern of the alert teacher. A pleasant and harmonious classroom is fundamental. The teacher should be kind, but firm; sympathetic, but exacting; friendly, but reserved.

DIRECT HEALTH INSTRUCTION. The aim of a health instruction program is to aid in the development of healthful behavior in pupils. Such behavior should be revealed through daily habits, the expression of

desirable attitudes, and the grasp of a body of scientific knowledge which will provide a basis for intelligent self-direction. It is recognized that the experiences of the child condition his behavior, and that health education is the product of a variety of experiences and situations in the home, school and community. The instructional program in the school should be so organized that it will make its contribution to the development of a scientific, wholesome, intelligent attitude concerning individual and community health, and the shaping of behavior in accordance with recognized scientific knowledge and desirable social standards.

The instructional plan for the junior high school provides for any of the following:

Note: Plan B or C_s are recommended.

Plan A

Five periods per week of health instruction taught as a classroom subject, usually as a substitute for one of the elective subjects in the junior high school. In order to make the course practical it is suggested that, if this plan is offered, it be required of all pupils.

Plan B

A five-period per week course in health and physical education providing three periods per week of activity and two periods per week of health education. This course may be substituted for any of the electives in the junior high school. It must be required of all pupils, thus becoming a local constant.

Plan C

Plan C type of health instruction offers many possibilities. It is built upon the base of two periods per week of physical activity. In addition some health education is provided. If the time allotment provides for two periods of physical education and one period per week of health education, the plan is known as Plan C_s. If four periods per week are provided, two periods of which are for physical education and two periods per week for health education, the plan is known as Plan C₄. Or if there are five periods devoted to physical education and health (three periods per week of activity and two periods per week for health education), it is known as Plan C_s.

Plan D

In using Plan D, certain selected units should be definitely assigned to subjects to be taught as health units—**not as incidental material**. This assignment shall be made by the superintendent or principal upon the recommendation of the health director who in turn should obtain the advice of the school health council. Probably only certain selected units can be covered and it is recommended that assignments be made to those subjects which are considered as constants, so that all pupils are exposed to a certain definite amount of health education.

PART 1

PERSONAL EFFICIENCY FOR LIVING

PERSONAL HEALTH APPRAISAL

DENTAL HEALTH

MAINTAINING VIGOR

NUTRITION

SECTION ONE

PERSONAL HEALTH APPRAISAL

Suggested Time: Eight Class Periods

Unit I. What Is My Personal Health Status? (Five Class Periods)

Unit II. What Does a Medical Examination Reveal Concerning My Health Status? (Three Class Periods)

OVERVIEW

Procedure in the development of a functional health course for junior high school pupils necessitates recognition of pupil health needs. The making of a personal health appraisal will assist the pupil in recognizing these needs. Pupil participation in the various screening tests will furnish valuable data indicating the pupils in need of medical attention. A class analysis of the results of the appraisal will furnish opportunity for a functional experience in allowing pupils to plan for more effective health examinations and care of remediable defects. Personal analysis of the results of each individual's health appraisal and screening tests should be an outgrowth of a pupil-teacher conference, and also an opportunity for effective guidance on the part of the health teacher. The value of a medical examination should be stressed. A logical outcome of the unit might be that all pupils would strive to be examined by their family physician and to have any remediable defects corrected.

BIBLIOGRAPHY

Pupil References (See general bibliography for addresses of publishers.)

SOURCES	PAGES	
	Unit I	Unit II
Brownell and Williams, Living and doing		87-92
Brownell and Williams, Training for living		193-202
Brownell and others, Adventures in growing up	332-344	348-358, 363, 367-387
Burkard and others, Health for young Americans	3-11	15-16
Burkard and others, Working together for health.....	3-9, 12-13, 28, 93-94, 174-177	246-247
Charters and others, Growing up healthily	3-19, 255-257	
Charters and others, Health in a power age	299-302	193-197
Fowlkes and others, Success through health		10-12
Turner and others, Building healthy bodies	15-18	
Turner and others, Working for community health.....	6-13, 245-247	247-249
Wilson and others, Health progress.....	341-344	
Wilson and others, Modern ways to health		70-81, 335-341

Library References for Pupils

Note: Consult local librarian for books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References (See general bibliography for publishers.)

American Assn. of School Administrators, Health in schoolsUnits I, II

Bovard and Cozens, Tests and measurements in physical educationUnit I

Byrd, Health instruction yearbook.....Units I, II

Clarke, Application of measurement to health and physical educationUnit I

National Education Assn., Health education.....Units I, II

Sources of Free and Inexpensive Materials (See general bibliography for addresses of publishers.)**American Medical Assn.**

Suggested school health policies (revised 1945). For the teacher and administrator. (Single copy free if requested on official letterhead.).....Units I, II

Metropolitan Life Insurance Co.

The school health program. School health monograph No. 12. For the teacher. Free.....Units I, II

Pounds and inches. About height-weight records. For the teacher. Free.....Units I, II

Minnesota Public Health Assn.

Baldwin-Wood age-height-weight tables for boys and girls; also individual growth graphs. Free.....Unit I

Minnesota Society for the Prevention of Blindness

Routine eye examination of school children. For nurses and teachers. Free.....Unit I

National Society for the Prevention of Blindness

Eye inspection and vision testing; a screening process.....Unit I

Write for price list of inexpensive vision testing supplies.

U. S. Office of Education

Physical fitness through health education. 1943. 20c.....Units I, II

What every teacher should know about the physical condition of her pupils. Pamphlet No. 68 (revised 1945). 10cUnit I

UNIT I

WHAT IS MY PERSONAL HEALTH STATUS?

Suggested Time: Five Class Periods

OBJECTIVES

To know what my health assets and liabilities are.

To improve my health by making any necessary changes in my living habits and by obtaining medical and dental attention for necessary improvements or corrections.

SUGGESTED ACTIVITIES

Recognize the Problem

Make a personal health appraisal, using the following form:

Note: This form may be duplicated for pupils' use. It can be retained and referred to from time to time when various items are discussed throughout the course. The check list should help the pupil to evaluate his physical status and to become aware of some of the factors which are important in appraising sound health. A slight deviation from normal in one or two items does not necessarily indicate that the pupil is in poor health; however, he must be taught that such symptoms or signs **may** be an indication that something is wrong and that he is in need of medical guidance. The pupil must understand that when any of the deficiencies persistently occur, or certain combinations occur simultaneously, that his health may be seriously endangered necessitating medical attention.

HOW CAN I APPRAISE MY PERSONAL HEALTH?

Items To Be Checked	Yes	No
General Condition and Posture		
1. Have I gained weight during the past three months?		
2. Is my weight within normal deviation from the averages shown for people my height, age, and sex?		
3. Do I usually have a good appetite?		
4. Do I sleep soundly?		
5. Do I feel rested in the morning?		
6. Do I sit, stand, and walk tall?		
7. Am I free from persistent worry and anxiety?		
8. Am I free from regularly recurring or persistent pain and discomfort?		

Items To Be Checked	Yes	No
9. Do I enjoy my work and play? 10. Do I have a satisfactory bowel movement daily?		
Eyes and Vision		
1. Are the pupils of my eyes equal in size? 2. Does the size of the pupils adjust to light and distance? 3. Are my eyelids free from irritation, inflammation, puffiness and twitching? 4. Do I see objects clearly both at a distance and at close range (usual reading distance for printed matter)? 5. Is the white part of my eyes clear? 6. Can I pass the Snellen eye chart test?		
Ears and Hearing		
1. Do I hear well what others say to me? 2. Am I free from earaches? 3. Am I free from any ear discharge? 4. Have I had my hearing tested since entering junior high school?		
Face, Mouth, and Teeth		
1. Do I have color in my lips and cheeks when I get up in the morning? 2. Do I breathe through my nose? 3. Have I visited the dentist during the past six months? 4. Am I free from toothaches? 5. Do I have teeth with good alignment? 6. Are my teeth well cared for? 7. Am I free from frequent sore throats and colds?		
Skin		
1. Is my skin clear and smooth? 2. Do I wash my face daily with warm water and soap?		
Feet		
1. Do I have strong arches? 2. Do I wear shoes that fit my feet properly? 3. Are my feet free from corns, bunions, blisters or foot deformities?		
Immunizations and Tests		
1. Was I vaccinated against smallpox at the time of entering elementary school? 2. Have I been vaccinated against smallpox during the past five years? 3. Have I been inoculated against diphtheria? 4. Have I had the Mantoux test or an X-ray for tuberculosis within the last year?		

A committee of pupils may summarize the results of the health appraisal for the group and present a report on the health status of the group.

Note: The discussions should be general. Any individual problems should be considered as a teacher (counselor) and pupil relation. Use code numbers rather than names on the appraisal sheets from which the committee makes its summary.

Develop the Problem

On the basis of the above report, pupils and teacher can plan health improvement procedures for the group. Such procedures might include:

1. A health inspection by nurse or teacher, including such screening devices as measurement of height and weight, vision and hearing tests. Suggestions for this inspection are:
 - a. Measure height and weight and compare with averages given in Baldwin-Wood age-height-weight tables (write Minnesota Public Health Assn.) Weights for school children are usually considered within normal range if they are within ten per cent below or twenty per cent above the standard given for age and height.
 - b. Have vision tests using Snellen charts (Teacher reference: U. S. Office of Education, Pamphlet 68).
 - c. Have a hearing test (Teacher reference: U. S. Office of Education, Pamphlet 68).
 - d. Check posture and condition of feet (Teacher reference: U. S. Office of Education, Pamphlet 68).
 - e. Check pulse rates before and after exercise (Teacher reference: Bovard and Cozens, Tests and Measurements in Physical Education, or Clarke, The Application of Measurement to Health and Physical Education).
2. Examination of texts, reference books, pamphlets, leaflets, charts, and other supplementary material to discover suggestions for correcting the health deficiencies of this group.
3. A panel discussion of the reasons why the individual pupil is unable to judge completely his own health status. Suggestions:
 - a. The individual is unable to "analyze" completely personal health conditions.

- b. Defects may exist in beginning stages with no symptoms apparent to lay person.
 - c. The individual may have become accustomed to defects which he is unable to recognize as deviations from the normal.
4. Group discussion of the statement, "Your health depends upon what you do, not upon what you know."
5. Individual conferences with the nurse or teacher to plan a procedure for individual health improvement on the basis of the pupil's "Health Record Card" and his personal health appraisal.

Note: The health record card is kept on file in the central office. Duplicates may be kept by the teacher, health director or nurse.

Secure copies of health examination blanks from an insurance company, a college, an industrial concern, or others, and compare the questions asked concerning the individual's health status.

Evaluation

Write a summary of health assets and liabilities as recognized after the activities of the unit.

Outline in writing the specific things to do to correct health defects.

Note: Since obtaining medical or dental attention may take some time and since health improvement often comes slowly, it would be well to make the evaluation of this unit a continuing process. Periodically teacher and pupil may use the summary and outline above, prepared by the pupil himself, as a guide for checking his health progress.

TERMS AND CONCEPTS

Anxiety, appraisal, assets, bunions, complexion, corns, defects, deformities, inflammation, inoculated, liabilities, Mantoux test, posture, pulse rate, sallow, worry, vaccinated.

SUGGESTED CONTENT

There is no content suggested for this introductory unit. The discussion will be based on the results obtained by carrying out the suggested activities. The pupils will learn by actually participating in the activities.

UNIT II

WHAT DOES A MEDICAL EXAMINATION REVEAL CONCERNING MY HEALTH STATUS?

Suggested Time: Three Class Periods

OBJECTIVES

To realize the value of periodic medical examinations.

To develop a wholesome attitude toward physicians and medical examinations.

SUGGESTED ACTIVITIES

Recognize the Problem

Discuss the problems that would exist in the community if it did not have a physician.

Discuss the reasons for having periodic medical examinations.

List the possible phases of a medical examination, i.e., what the physician would check on.

Develop the Problem

Arrange for talks to the class by a nurse or physician on the procedure, purpose, and value of periodic health examinations.

Find out what the cost of a thorough physical examination would be. Determine what information will be helpful to the physician in making the examination and recommendations.

Discuss how to select a physician and arrange for a medical examination.

Report to the class after having examinations the procedures and instruments used by physicians in making medical examinations.

Conduct a panel discussion on the topic "How to select a physician."

Evaluation

Determine the individual health needs and arrange for an adequate remedial and corrective program.

TERMS AND CONCEPTS

Acuity, average, audiometer, blood count, blood pressure, function, medical examination, microscope, normal, otoscope, reputable, Snellen chart, stethoscope, susceptibility, tubercle bacilli, urinalysis, X-ray.

SUGGESTED CONTENT

A. What are the purposes of a medical examination?

1. To enable the physician to diagnose deviations from normal and make recommendations for their correction.
2. To discover if weight is normal for height, age and sex.
3. To determine whether there are defects of eyes, ears, nose, throat and mouth.
4. To know whether the heart functions normally.
5. To determine the condition of the blood, blood pressure and rate of heart beat.
6. To detect any signs of lung abnormality.
7. To check any skin infections.
8. To determine postural defects.
9. To determine the condition of the nervous and endocrine systems.
10. To check any abnormalities of the abdomen, kidneys, genitalia, and extremities.

B. What are some of the tests the physician will make? What instruments will be used?

1. Testing lungs, heart, pulse by means of the stethoscope.
2. Testing the visual acuity of the eyes, using the Snellen chart; examining the retina of the eye, using the ophthalmoscope.
3. Examining the ear with otoscope and testing hearing with the audiometer.
4. For more careful examination of lungs, teeth and bones, the X-ray may be used.
5. The blood count or proportion of red to white blood cells may be checked by using the microscope.
6. In checking for diabetes, or possible kidney and bladder infection, a urinalysis is usually made.
7. The following susceptibility tests may be used to determine what persons need protection:
 - (1) Schick—to determine whether one is susceptible to diphtheria.
 - (2) Dick—to determine whether one is susceptible to scarlet fever.
8. The Mantoux test may be used to determine whether one has or has had an infection with tubercle bacilli.

C. What is the value of periodic medical examinations?

1. Lead to early discovery of physical defects before they become too serious.

2. Promote correction of physical defects.
 3. Tend to prevent future physical defects by enabling physician to give expert medical advice and make recommendations for healthful living.
- D. What procedures should be followed in selecting a physician?
1. Obtain recommendations from the superintendent of a leading hospital.
 2. Get information from secretary of the local or county medical society concerning the training and experience of the members. A physician should be judged by his training, ability, experience and character.
 3. Ask neighbors what physician they would call if their own doctor was not available.
 4. Inquire who takes care of doctors' families when they are ill.
 5. If moving to new locality have present trusted family physician make inquiries as to whom to go.
 6. A reputable physician does not advertise in a commercial way. Avoid the so-called physician who guarantees a cure, advertises his skill or who carelessly makes a diagnosis without the aid of modern scientific instruments.

SECTION TWO

DENTAL HEALTH

Suggested Time: Seven Class Periods

Unit III. How Can One Achieve and Maintain Good Dental Health?
(Seven Class Periods)

OVERVIEW

According to dental authorities much inaccurate information is found in textbooks and other health literature concerning dental health.* An effort has been made to include in this unit on the junior high school level only the fundamental basic facts relating to dental health. The best sources of factual information for the pupils will be found in the section of the bibliography on "Sources of Free and Inexpensive Materials."

Emphasis is to be given to early and frequent dental care, home care and diet as the most important concepts to be developed in the formation of desirable attitudes and habits.

*Irwin and Wilson, An Evaluation of Dental Health Literature.

BIBLIOGRAPHY

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Brownell and Williams, Training for living.....	246-250
Brownell and others, Adventures in growing up.....	132-134, 374-376
Burkard and others, Health for young Americans.....	52-63, 72-73
Burkard and others, Working together for health.....	270-273
Charters and others, A sound body.....	34-48
Crisp, Health for you.....	72-89
Fishbein and Irwin, Health and first aid.....	79-87
Fowlkes and others, Making life healthful.....	114-120
Fowlkes and others, Success through health.....	310-317, 327-330
Turner and others, Building healthy bodies.....	165-184
Wilson and others, Modern ways to health.....	92-114

Library References for Pupils

Note: Contact local librarian for books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References

(See general bibliography for publishers.)

American Assn. of School Administrators, Health in schools.....	Unit III
American Dental Assn., Teeth, health and appearance.....	Unit III
Diehl, Textbook of healthful living.....	Unit III
National Education Assn., Health education.....	Unit III

Sources of Free and Inexpensive Materials

(See general bibliography for addresses of publishers.)

American Dental Assn.

Cady, F. C., and Pelton, W. J. The school child's teeth.
5c. Unit III

Charts on dental health. Set of eight (the teeth; the deciduous teeth; the permanent teeth; diet and teeth; dental care; mouth hygiene; preventing decay of the deciduous teeth; preventing decay of the permanent teeth), 22"x29" in colors. \$1.00 per set..... Unit III

Write for free list of dental education material for junior high school.

Minnesota State Department of Health

Dental health for the children of Minnesota. For the teacher. Free.....Unit III

Drenckhahn, V. V., and Taylor, C. R. Your child's teeth. American Dental Assn. 10c. (Free to Minnesota teachers from the Minnesota state department of health.)Unit III

Instruction sheet for using the high school dental health card; also samples of dental health cards. Free.....Unit III

National Dental Hygiene Association

Facts . . . about teeth and their care. Single copy 10c. For pupils.....Unit III

Write for quantity prices. (Single copy free to Minnesota teachers from Minnesota state department of health.)

Visual Aids (See general bibliography for addresses.)

Film Preview

The teeth: development and care. 10 min. 16 mm. sound. \$1.....Unit III

Minnesota State Department of Health

About faces (teeth). 25 min. 16 mm. color. sound. Free. Unit III

How teeth grow. 15 min. 16 mm. sound. Free.....Unit III

UNIT III

HOW CAN ONE ACHIEVE AND MAINTAIN GOOD DENTAL HEALTH?

Suggested Time: Seven Class Periods

OBJECTIVES

- To gain an understanding of the structure, function and arrangement of teeth.
- To learn the need for proper care of teeth and the value of seeing the dentist regularly.
- To develop an interest in the appearance of the teeth and mouth.

SUGGESTED ACTIVITIES

Recognize the Problem

- Visit dentist for a complete dental checkup. (Use dental card which should be returned to school when defects have been corrected.)
- Determine in each individual's case what permanent teeth he does not have as yet.
- Observe the teeth of younger brothers and sisters. Discuss how and when teeth develop.

Develop the Problem

- Give an oral report on the use of dental equipment following a visit with the dentist in his office during which the equipment has been explained.
- Bring different types of toothbrushes to class and discuss their relative merits after consulting the dentist about the proper type of toothbrush.
- Demonstrate how to brush the teeth properly, how to use dental floss and how to massage the gums. Obtain directions from a dentist, especially for the last two procedures.
- Discuss the functions of the teeth.
- Collect teeth, if available, from other animals. Dissect them to show structure.
- Study charts showing the structure of a tooth.
- Find out how dental caries occur. List the precautions to take to prevent decay.
- Discuss the part nutrition has in tooth formation and prevention of decay.
- Make a report on diseases of the gums, and the care that should be exercised to prevent such disease.
- Find out how the rest of the body is affected by abscessed teeth.

Study charts showing the permanent set of teeth in proper position and in case of malocclusion.

Determine what handicaps result from malocclusion or other irregularities in the teeth.

Compare the deciduous and the permanent sets of teeth in regard to the kind and number of teeth and the care to be given each set.

Evaluation

Make a drawing of one's own permanent set of teeth indicating names of the teeth. Note the arrangement of the teeth and those filled or replaced by a dentist.

Make an oral report or write a summary on the value of having periodic examinations by dentist.

Determine the percentage of pupils in the class who have had dental examinations in the past six months and the percentage who had the necessary corrections.

TERMS AND CONCEPTS

Abscess, bicuspid, calcium, caries, cementum, crown, cuspid, decay, deciduous teeth, dentine, enamel, incisor, malocclusion, mastication, molar, neck, permanent teeth, phosphorus, pulp, pyorrhea, root.

SUGGESTED CONTENT

A. What are the functions of the teeth?

1. Mastication or the chewing of food is an important function of the teeth and one of the first steps in digestion.
 - a. Incisors—bite and cut the food.
 - b. Cuspids and bicuspid—tear the food.
 - c. Molars—grind the food into fine particles.
2. Teeth aid in making certain sounds and are necessary for clear speech.
3. Teeth give shape to the mouth and face, hence affect personal appearance.
4. Additional reasons why healthy teeth are worth while:
 - a. Uncared for decayed teeth may seriously interfere with health and comfort. Abscess may result which will give rise to infection of other body parts. Neglected decay results in toothache and may necessitate extraction.
 - b. Irregular teeth and loss of teeth will affect personal appearance.
 - c. Irregular, lost or broken teeth and unpleasant breath, frequently caused by unclean or decayed teeth, interfere with social and business success. Young people with such handicaps often become self-conscious and lack confidence.

- d. Deteriorated teeth cost a great deal to repair, not only in money, but also in time and unpleasantness. Early dental treatment causes much less discomfort and requires far less time and money than treatment necessitated by delay and neglect.

B. What is the structure of a tooth?

1. The parts of the tooth
 - a. The crown is the visible part of the tooth.
 - b. The neck is the part where root and crown join.
 - c. The root is within the jaw.
2. The composition of the tooth
 - a. The main part of the tooth is dentine.
 - b. The pulp center of the tooth contains nerves and blood vessels.
 - c. The root of the tooth is covered with cementum.
 - d. The crown is covered with the hardest substance in the body, namely, enamel.

C. What is the arrangement of the teeth and when do they erupt?

Deciduous or baby teeth				Permanent teeth			
Name	No.	Erupt		Name	No.	Erupt	
Central incisor	4	6-8 months	replaced by	Central incisor	4	6-8 years	
Lateral incisor	4	8-10 months	replaced by	Lateral incisor	4	7-9 years	
Cuspid	4	16-20 months	replaced by	Cuspid	4	9-12 years	
First molar	4	12-16 months	replaced by	First bicuspid	4	10-12 years	
Second molar	4	20-30 months	replaced by	Second bicuspid	4	10-12 years	
				First molar	4	6-7 years	
				Second molar	4	11-13 years	
				Third molar (wisdom tooth)	4	17-21 years	

The deciduous teeth develop before birth, begin to erupt when a few months old, and are usually complete at two and one-half years. The permanent teeth begin growth at time of birth, begin to supplement deciduous set when child is six years of age. The "sixth year molars" are the first of the permanent set to appear. The deciduous teeth are twenty in number, and the permanent teeth, thirty-two.

D. To what diseases and abnormalities may teeth be subject?

1. Decay
 - a. Bacteria grow readily in the warm moist mouth.
 - b. Food remaining on the teeth aids the growth of bacteria.
 - c. When enamel is broken or scratched an entrance is provided for bacteria; decay may then result due to acids produced by bacterial action on food, particularly carbohydrate foods.
2. Abscesses often occur at the roots of teeth with resultant drainage of toxic products into the system. These toxic products may cause fatigue and various aches and pains, while bacteria which are absorbed may set up infections in various parts of the body.

3. Gums are sometimes affected by Vincent's infection (trench mouth), pyorrhea, and gingivitis.
4. Teeth in the two jaws may not meet (malocclusion) due to crowding of the teeth, eruption of a permanent tooth before the temporary one is loosened causing irregularity of the teeth, or to such habits as thumb sucking, tongue, lip, or cheek-biting, or mouth breathing.

E. What care should I give my teeth?

1. Early and frequent dental care

- a. Visiting the dentist periodically for a checkup insures better care of teeth. Some cavities or irregularities are found only when the X-ray is used.
- b. A prophylaxis by a dentist or dental hygienist is necessary to remove tartar. Tartar may cause inflammation of the gums (gingivitis).
- c. Straightening the teeth by an orthodontist may be done with the aid of braces.

2. Home care

- a. Brushing removes food from the teeth and aids in the prevention of dental caries, removes unpleasant odor caused by food deposits (proteins in particular) and aids personal appearance.
- b. A small or medium-sized brush with stiff bristles arranged in widely spaced rows to allow for easy cleaning of the brush should be used for brushing teeth.
- c. The teeth should be brushed on all surfaces which can be reached by the brush by using a gentle vibratory motion with pressure only on the upward stroke for the lower teeth and gums and only on the downward stroke for the upper teeth and gums. Surfaces not reached by the brush should be cleaned with dental floss if information is obtained from the dentist on its proper use.
- d. Massaging the gums helps prevent pyorrhea, if done correctly under the direction of a dentist.
- e. Dentrifices and mouthwashes aid in mouth cleanliness. They are of little value to the prevention of tooth decay or other dental diseases.
- f. Refraining from biting hard objects helps preserve tooth enamel.

3. Diet

- a. Eating nutritious foods during the formative period of the tooth enamel helps to build strong teeth (calcium, phosphorus and vitamins are needed).
- b. Avoid sweet and starchy foods between meals, especially candy, soft drinks, gum, cakes and cookies, to reduce the rate of decay.

SECTION THREE

MAINTAINING VIGOR

Suggested Time: Twelve Class Periods

UNIT IV. How Do the Structure and Alignment of the Body Organs Contribute to Total Fitness? (Seven Class Periods)

UNIT V. How Do the Respiratory and Circulatory Systems Aid in Maintaining Vigor? (Five Class Periods)

OVERVIEW

Total body fitness is dependent on the proper functioning of the systems of the body. The systems, including the skeletal, muscular, circulatory and respiratory, are interdependent and the degree of efficiency of one may affect the efficiency of all the others. Individual projects for pupils should be developed to aid in establishing total fitness. As an example, posture may be corrected by improving muscular tone through physical and recreational activities. Gracefulness and poise may be emphasized in appealing to the girls and masculine efficiency may serve as an incentive for boys.

Efficient respiratory and circulatory systems are maintained through sufficient exercise, regular periods of rest and sleep, good posture and proper nutrition. Development of desirable habits related to these factors is most important.

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Note: Consult local librarian for books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References (See general bibliography for publishers.)

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American Medical Association

Fordyce, Claude P., Knapsacking for health. 5c.....	Unit IV
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Brockway, Alva, Stand up straight. 10c.....	Unit IV
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No. 1 The framework (bones).....	Unit IV
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Hennepin County Tuberculosis Association

What a happy sight, series, posture posters, free.....	Unit IV
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John Hancock Life Insurance Company

Sleep the restorer, free.....	Units IV, V
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Standing up to life, free.....	Unit IV
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Minnesota Public Health Association

As others see us, poster, free.....	Unit IV
Everybody's health, magazine, \$1 per year, single copy, 10c	All units
How do you walk, pamphlet, 10c.....	Unit IV
Lady look out below, poster, free.....	Unit IV
Large three bear poster, 10c.....	Unit IV
Posture posters, 12c.....	Unit IV
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UNIT IV

HOW DO THE STRUCTURE AND ALIGNMENT OF THE BODY ORGANS CONTRIBUTE TO TOTAL FITNESS?

Suggested Time: Seven Class Periods

OBJECTIVES

- To recognize the cell as the unit of structure of the body.
- To gain an understanding of the structure of the skeletal and muscular systems in the body.
- To develop an appreciation of the contribution of exercise, sleep and rest to the general well-being of the individual.

SUGGESTED ACTIVITIES

Recognize the Problem

- Discuss: The relationship of the cell as the unit of structure of the body to a brick as a unit of structure of a brick wall.
- Discuss: Is it possible for a boy who delivers papers to develop poor posture because of his work?
- Discuss: How do high heeled shoes contribute to poor posture?
- Discuss: Why do movie stars take training in posture?

Develop the Problem

- Diagram the structure of a cell after examining under a microscope the scrapings from the inside of the cheek, the inner layer of an onion skin and the skin of a flower petal.
- Test members of the class with a plumb*line for good or faulty posture.
- Place a small amount of hay in a beaker, cover with water and allow to stand for a few days in a warm place. Observe a drop of water taken from beaker under low and high power microscope. Do these one-celled animals exhibit any of the characteristics of the human body?
- Prepare a bulletin board display of examples of good and poor posture.
- Place a chicken bone in dilute hydrochloric acid and let it stand for half a day. Notice how the bone has changed. What has been removed?
- Place a chicken bone on a wire mesh, place over a Bunsen burner and heat until bone is practically ashes. With a platinum wire get some of the ashes, dip in hydrochloric acid and place in Bunsen flame. Red color denotes the presence of calcium.

Make imprints of feet of each class member by having them wet the soles of feet and then stand on brown wrapping paper. Develop a set of exercises to be used by any pupil having poor arches.

Obtain one of the long bones of a cow from the local butcher. Saw it longitudinally and horizontally to study internal structure.

Evaluation

Discuss: Why do athletes train? Include in discussion nutrition, rest and sleep, and efficiency of muscles. Prepare and follow a set of desirable training rules for athletes.

Prepare and give a class demonstration on how to sit, stand and walk correctly.

Sponsor a school-wide "Posture Day." Have committee place a bright colored tag on each individual who exhibits good posture.

TERMS AND CONCEPTS

Animal matter, biceps, carpals, cartilage, cells, compound fracture, connective, dislocation, false ribs, fatigue, femur, fibula, flat feet, fracture, greenstick fracture, ligaments, locomotion, marrow, metacarpals, metatarsals, mineral matter, nucleus, organs, phalanges, posture, protoplasm, reproduction, rest, simple fracture, sleep, sprains, tarsals, tendons, tibia, tissue, triceps, true ribs, vertebral column, warm-up.

SUGGESTED CONTENT

A. What are the parts of the body and how are they constructed?

1. Cells are the building blocks of the body, or the units of structure. They may vary in size, shape, color and function.

a. Cells are composed of:

(1) Protoplasm—The liquid substance of which the cell is composed making possible the life activity of the cell.

(2) Nucleus—A small body within the mass of protoplasm which is responsible for the vital activities of the cell.

(3) Cell wall—A thin membrane surrounding the mass of protoplasm.

b. All cells develop through the repeated division of a single cell. Remarkable differentiations occur in the embryonic development as new cells are formed. Some appear as muscle cells, bone cells, nerve cells, skin cells, blood cells, and others.

2. Tissues are formed by cells of one type grouped together to perform a special function. Example: Muscle cells grouped together to form muscle tissue,

3. Organs are formed by tissues of different kinds grouped together to perform some special function. Example, The stomach is an organ composed of muscle tissue, nerve tissue, epithelial tissue and blood tissue, all of which cooperate in aiding the digestion of food.
 4. Systems are formed for the coordination of the various organs of the body. Systems of the body do not function separately but all of them work together in close cooperation. Example: Organs of the skeletal system are the skull (cranium), vertebral column, thorax, shoulder girdle, pelvis, arms, and legs. The skeletal system can function only in cooperation with all culatory, digestive, endocrine, respiratory, nervous, excretory the other systems of the body, which are the muscular, cir- and reproductive.
- B. How is the skeletal system constructed and how do we keep it functioning efficiently?
1. How are bones constructed?
 - a. Bones are living structures made up of organic matter and inorganic matter.
 - (1) Organic matter is the living part of the bone which is a tough elastic material, as in cartilage.
 - (2) Inorganic matter is the calcium, phosphorus and other mineral elements that are deposited in cartilage to give it rigidity and strength.
 - b. Bones are shaped according to the type of work they are to do.
 - (1) Bones intended for protection of internal organs of the body are flat. Examples: Cranium and pelvis.
 - (2) Bones intended to act as levers for the purpose of locomotion are long and slender. Examples: Bones of the arms and legs.
 - (3) Bones which are associated with flexibility of movement are either round or irregular in shape. Examples: Bones of the spinal column, wrists and ankles.
 - c. Both the spongy and hollow bones are filled with a substance called marrow.
 - d. Bones are covered with a thin, tough membrane called the periosteum from which blood enters the bone through winding channels.
 2. What injuries may occur to bones?
 - a. Fractures or breaks in bones, all of which require a physician's attention, may be caused by falls, blows, or heavy objects falling on bones. (Units XXIV, XXX.)

- (1) Simple fractures — A condition where the bone is broken but the skin remains intact. A greenstick fracture is a condition in which the bone is only partially broken through. There is no danger of infection in these fractures.
 - (2) Compound fracture — A condition when the bone is broken and the skin is punctured. The danger of infection is great.
3. How can we help the body to build strong bones?
- a. Proper diet, fresh air, exercise, rest and sleep all contribute to the development of strong healthy bones.
 - b. Plenty of sunshine aids the body in getting sufficient vitamin D.
 - c. Good posture at all times helps the bones to grow correctly and to do their work more effectively.
4. How are the bones put together to form the skeleton?
- a. The 206 bones of the body are joined together to form a strong jointed framework for the support and protection of the body organs, and for locomotion.
 - (1) The joining surfaces of movable bones are made of cartilage which is lined with a thin membrane that secretes a fluid to lubricate the joint. Examples: Knee and elbow.
 - (2) The joining surfaces of movable bones are held securely in place by strong white fiber bands called ligaments.
 - (3) Joining surfaces of immovable joints are cartilage when the individual is born. In a few years the cartilage is replaced by bone, making the two bones practically one. Example: Bones of the skull.
 - b. Joints are classified according to the freedom of movement they allow.
 - (1) Immoveable—Little or no movement involved. Example: Bones of the cranium.
 - (2) Slightly movable—Limited movement such as twisting and bending. Example: Bones of the vertebral column.
 - (3) Freely movable—Freedom of movement greater than the above-mentioned classifications. Two types of joints are found in this group: Hinge joints (knee and elbow), and ball and socket joints (shoulder and hip).
5. What injuries may occur to joints? (Units XXIV, XXX.)
- a. Sprains—A sudden twist or fall may tear some of the supporting tissue from bones causing sharp pain and swelling. Common injuries are sprained wrists or ankles.

- b. Dislocations—Blows, falls or severe muscular effort may cause bones to get out of place at the joint. The services of a physician are necessary to replace the bones.
- c. Torn ligaments—Sprains and dislocations may be accompanied by tearing of the ligaments that bind the bones together to form the joint. This is a serious injury and requires the service of a physician.

6. What are the three parts of the skeleton?

- a. Bones of the head form a protective covering (skull) for the brain, protective cavities for the eyes and ears, passageway for air, and adaptations for the chewing of food (jaws and teeth).
- b. Bones of the trunk form protective cavities for vital organs.
 - (1) Vertebral column is composed of twenty-six vertebrae which are the main support of the weight of the body and serve as a protection for the spinal cord. The top seven vertebrae are found in the neck; the next twelve serve as attachments for the ribs and help form the rear wall of the chest cavity; the next five help form the rear wall of the abdominal cavity; the next one (composed of five fused vertebrae) serves as an attachment for the pelvis and helps form the floor of the abdominal cavity and the last one (composed of four fused vertebrae) is referred to as the tailbone.
 - (2) Shoulder girdle is composed of the collarbone in front and the shoulder-blade in back. The shoulder-blade has a small cavity into which the rounded head of the bone of the upper arm fits to form the shoulder joint.
 - (3) Breastbone (sternum) and the ribs form the front of the chest cavity (thorax). The breastbone serves as a place of attachment for seven pairs of the ribs.
 - (4) Ribs form the sides of the chest cavity. Seven pairs of the ribs are known as true ribs because they attach to both the vertebral column and the breastbone. The next three pairs attach in the front to the seventh rib by strong fibers and are called false ribs. The remaining two pairs of ribs attach only to the vertebral column and are known as floating ribs.
 - (5) Pelvis is the bony floor of the abdominal cavity, serves as a support for the organs of the abdomen, and as a place of attachment for the legs. The rounded head of a thighbone fits into a cup-like depression in each side of the pelvis to form a hip joint.

c. Bones of the limbs

- (1) The bone of the upper arm is the humerus. The bones of the forearm are the radius on the thumb side of the arm and the ulna on the small finger side of the arm. The wrist bones are carpals, the hand bones are metacarpals and the bones of the fingers are phalanges. Each of the thumbs is composed of two phalanges while each of the fingers has three.
- (2) The thigh or upper leg bone is the femur which is the longest bone of the body. The lower leg is composed of the shin bone, or tibia, and the fibula which is on the small toe side of the leg. The ankle is composed of tarsals; the feet, of metatarsals, and the toes, of phalanges.

7. What is the normal arrangement of the bones of the feet?

- a. Bones of the feet are arranged in the form of arches for supporting the weight of the body.
 - (1) Longitudinal arch—Extends from the heel to the base of the toes.
 - (2) Transverse arch—Is at right angles to the longitudinal arch and extends from the base of the large toe to the base of the small toe.
- b. The bones forming the arches are firmly held together by ligaments and are elastic enough to absorb jars and shocks. Muscles of the feet also help to support the arches.

8. What factors may cause flat feet and how can they be corrected?

- a. Flat feet are a condition whereby the supporting muscles of the arches of the feet become weakened and the ligaments stretched, causing the arch to lose its curve. This places the weight of the body on muscles of the feet and legs which were not intended to support it.
- b. Some factors which may cause flat feet are:
 - (1) Wearing improperly fitted shoes.
 - (2) Excessive turning out of the toes while walking.
 - (3) Standing for long periods of time on hard surfaces.
 - (4) Having poor muscle tone possibly caused by faulty diet.
 - (5) Being overweight.
 - (6) Heredity may be a contributing cause.
- c. Flat feet may be corrected by a well-planned program of corrective exercises, and a well-balanced diet to improve muscle tone. Arch supports should be used only on the advice of a specialist.

9. What three main purposes does the skeleton serve?
 - a. To form a framework for the body.
 - b. To make locomotion possible.
 - c. To protect the vital organs of the body.

C. What are the nature and functions of muscles?

1. What is the structure of muscles?

The unit of structure of muscles is muscle cells. The muscle cells are arranged in long slender fibers. Many fibers are bound together by connective tissue forming bundles. Many bundles of muscle fibers are bound together by connective tissue to form the muscle. Muscles are attached to bones by means of tendons which enable the contracting muscle to move the part to which it is attached.

2. How do muscles work?

- a. Muscles produce motion by contracting. More than five hundred muscles of the body work in groups to gain additional strength.
- b. When one set of muscles moves a part of the body in one direction there is another set of muscles capable of moving the same part in an opposite direction. Example: When the biceps contract the forearm is raised, and when the opposing muscle, triceps, contract the forearm is lowered.
- c. Some of the muscles of the body are under our conscious control and are called voluntary muscles. Example: The forearm can be raised when the individual desires; thus the biceps are voluntary muscles. Likewise, the triceps are voluntary because the forearm can be lowered when desired.
- d. Other muscles of the body are not under our conscious control and are called involuntary muscles. Example: The heart muscles contract without any thought on the part of the individual.
- e. The muscles of the body are in a constant state of slight tension known as muscle tone. This keeps the muscles in a state of readiness for action. A weak flabby muscle is lacking in tone.

3. What factors contribute to the efficiency of muscles?

- a. Exercise — The best exercises are those that bring large numbers of muscles into action in brisk and strenuous activity.

(1) Some advantages of exercise are:

- (a) Increases the rate of breathing.
- (b) Increases the rate of oxidation.

- (c) Aids in eliminating waste materials from the body.
- (d) Increases muscle tone, strength and endurance.
- (e) Aids digestion.
- (f) Improves the heat regulating mechanism.

(2) Some dangers involved in exercise are:

- (a) Failure to prepare the body for activity by a short "warm-up" period may place a strain on some organs of the body.
- (b) Using of energy produces waste materials which carried away by the blood stream. Strenuous activity over a period of time will cause waste material to be produced faster than the blood can remove it. The waste material then accumulates in muscles and they become tired. This produces a general body weariness known as fatigue. Muscles thus lose their efficiency and rest is necessary to enable the blood to rid the body of waste material. Continued activity will lead to exhaustion which is very harmful to the body.
- (c) Excessive depletion of the energy of the body without proper replacement.
- (d) Taking part in activities not suited to the individual may produce harmful effects to the body. Example: Some boys' exercises and games are not suitable for girls, and individuals with organic defects should participate in activity suitable for their physical condition.
- (e) Attempting to perform exercises without the required skill or protection may result in injury. Accidents of this kind are sometimes the result of a dare.

(3) Some of the characteristics of suitable types of activity:

- (a) Be brisk and strenuous, but not exhausting, and interspersed with periods of rest.
 - (b) Use many sets of muscles.
 - (c) Be outdoors when possible.
 - (d) Be suited to the physical need and capacities of the individual.
 - (e) Develop skills that can be used in later life.
- b. Nutrition—Diets based on the seven basic food groups will supply the body with all the necessities for a healthful existence. (Unit VI.)

- c. Rest and sleep—Regular hours for sleep and rest and eight to ten hours sleep per night are necessary to keep the healthy body efficient.

(1) Sleep and rest are important because:

(a) They enable the body to rid itself of waste materials.

(b) They enable the body to repair itself.

(c) They enable the body to replenish the energy in the muscles.

(2) Regular periods of rest should be observed just as one observes regular periods of sleep.

(3) Sleep seldom occurs unless it is needed. Some factors involved are:

(a) The need for sleep is in proportion to the amount of energy used for activity and growth.

(b) The need for sleep is governed by the age of the individual.

(4) Some factors that aid in improving the quality of sleep are:

(a) Bed should be clean and comfortable, and have a level and firm mattress.

(b) Room should be dark and well ventilated.

(c) Body position should be comfortable.

(d) Physical and mental relaxation is important.

D. What is the relation of good posture to good health?

1. What is good posture?

a. Posture is good when the weight of the body is supported by the spinal column and there is a minimum of muscle and nerve strain because the bones are carrying out their work of support.

b. In correct posture an imaginary line from the side of the head passes through the middle of the ear, shoulder, hip, knee and the outer ankle bone.

c. Persons who lift things find that certain positions give more power than others.

d. There are a number of proper and improper postures for doing things. Proper posture is a matter of developing desirable habits for performing activity.

2. What factors contribute to poor posture?

a. Poor nutrition

b. Disease

- c. Injury
 - d. Occupation
 - e. Flat feet
 - f. Deafness and poor eyesight
 - g. Poor mental attitudes
 - h. Improper shoes
3. What are some ways in which posture can be improved?
- a. Correct any physical defects if possible.
 - b. Improve habits of standing, sitting, and walking.
 - c. Build strong muscles by exercise, fresh air, rest and nourishing food.
 - d. Maintain a happy, cheerful disposition.
4. What are the values of good posture?
- a. Improves appearance and enables one to make a good impression in school, in social life and in business life.
 - b. Gives the impression of energy, alertness and self-respect.
 - c. Promotes physical and mental health.
 - d. Promotes circulation and healthy muscular development.
 - e. Enables one to attain ease and grace of motion and readiness for action.

UNIT V

HOW DO THE RESPIRATORY AND CIRCULATORY SYSTEMS AID IN MAINTAINING VIGOR?

Suggested Time: Five Class Periods

OBJECTIVES

- To gain an understanding of the mechanics of respiration.
- To appreciate the contribution of a healthy respiratory system to the total fitness of the individual.
- To acquire a knowledge of the functions of the circulatory system.

SUGGESTED ACTIVITIES

Recognize the Problem

Count the number of times you breathe per minute after you have been sitting quietly for ten minutes; count again after you have vigorously exercised for two minutes, and again after resting for five minutes. What does this suggest?

Follow the same procedure as above in regard to the pulse. (Unit I)

Develop the Problem

Explain how good posture aids breathing.

Write a short report on the contributions of William Harvey to science.

Obtain a copy of a diagram of the circulatory system and trace the flow of blood through the pulmonary circulation system; through the systemic circulation system. Discuss the changes of the blood as it travels around the circulatory system.

Prepare a report on the "sulfa" and penicillin drugs. Show how they aid the body when used under the supervision of a physician.

Study and diagram blood as observed under the microscope. Prick a finger with a fine sterilized needle and place a small drop of blood on a slide. (Before pricking finger, wipe it with alcohol and sterilize the needle with alcohol or by passing it through a flame.) Place a cover glass on the blood and examine it with low power and then high power of the microscope. This must be done quickly to observe the true characteristics of the corpuscles.

Observe circulation of blood in the frog. Saturate a piece of absorbent cotton with water containing some ether. Wrap the saturated cotton around a tadpole or hold the cotton where a frog

must breathe the fumes. When the frog has become quiet place the tail of the tadpole or the web of the foot of the frog under the low power of the microscope. Observe the network of blood vessels. Now use the high power objective and again observe the blood vessels. Those vessels in which the blood moves in spurts are small arteries and those in which the blood moves steadily are veins.

Evaluation

Discuss: Why must an unconscious person who has been submerged in water be given artificial respiration quickly?

Prepare a report on some of the factors that may produce "heart disease."

Prepare conclusions as to the contributions of the respiratory and circulatory systems to physical fitness.

TERMS AND CONCEPTS

Adenoids, antibodies, aorta, arteries, auricle, bronchial tube, capillaries, choking, cilia, corpuscles, coughing, diaphragm, Eustachian tube, exhale, immunity, inhale, larynx, lymph, lymph glands, lymphatic system, pharynx, plasma, platelets, pleura, respiration, sinus, trachea, vein, vena cava, ventricle.

SUGGESTED CONTENT

A. How does the respiratory system contribute to fitness?

1. Respiration includes those processes by which oxygen is supplied to the tissues and carbon dioxide is removed from them.

a. How do the cells of the body obtain oxygen?

(1) Each cell of the body needs fuel (carbohydrates and fats) and oxygen to produce energy to enable the body to work. Oxygen comes from the air breathed. A constant supply of oxygen is necessary for the life of the cell.

(2) The body has built up a remarkable system for maintaining a constant supply of oxygen to the cells.

(a) Air passes through the nostrils, pharynx, larynx (voice box), trachea, bronchial tubes and into the millions of little air sacs (alveoli) that make up the lungs.

(b) Through the walls of the air sacs (alveoli) there is a constant movement of oxygen into the blood stream and a movement of carbon dioxide from the blood stream into the air sacs,

b. How do we breathe?

- (1) The conscious part of breathing is the expanding of the lungs when air is taken in (inhale) and the contracting of the lungs when air is given off (exhale).
- (2) The lungs do not have any power to expand, instead their elastic walls are constantly attempting to make them smaller.
- (3) When the chest cavity expands, by combined action of ribs and diaphragm, the greater air pressure on the outside of the body forces air into the lungs. This is termed inspiration.
- (4) The chest cavity is made smaller by the rib muscles relaxing, allowing the ribs to fall back to their original place and the diaphragm relaxing. The combined relaxation of the ribs and diaphragm, and the elastic lung trying to make itself smaller, causes the air pressure on the inside to be greater than the air pressure on the outside of the body thus pushing the air out of the lungs. This is termed expiration.
- (5) The rate of breathing is affected by the amount of carbon dioxide in the blood. The average rate of breathing for young people is approximately eighteen to twenty times per minute.
- (6) The size of the lungs is determined by the space allowed by the spinal column, ribs, breastbone and diaphragm.

c. How are air passageways protected?

- (1) Coarse, moist hairs in the nostrils catch dust and germs.
- (2) The lining of the air passageways and lungs contains little hairlike structures called cilia which keep up a continuous motion. Some of the germs are swept into the passageway of food to the stomach and are destroyed by the digestive juices. Some dust and germs may also be swept into the pharynx and expelled from the body by coughing, sneezing, spitting or blowing the nose.
- (3) The moisture of the mucous membranes collects dust and germs.

d. What are some additional air passageways and where are they located?

MAINTAINING VIGOR

- (1) Sinuses are air spaces in the skull. There is one large sinus under each eye, three along each side of the nose, one over each eye, and one extending back to the base of the skull. They serve to make the bones the head lighter in weight.
 - (2) The Eustachian tube extends from the pharynx to the middle ear and helps to equalize air pressure.
- e. What are some facts concerning the lungs?
- (1) Nature provides for emergencies by supplying the body with two lungs, although a person could survive on only one-twentieth of the normal lung tissue.
 - (2) The lungs resemble red sponges and are full of air and blood.
 - (3) The lungs are composed of many air sacs which are the endings of many small bronchial tubes. The bronchial tubes by continuous joining with other bronchial tubes form the bronchi. The bronchus from each lung joins to form the trachea or windpipe.
 - (4) Each of the lungs is covered with a thin membrane called pleura.
- f. How important is the diaphragm?
- (1) The diaphragm is a large flat muscle which forms the floor of the chest cavity.
 - (2) It is attached to the spinal column and the lower ribs. At the end of each respiration it rises up into the chest cavity forming a dome.
 - (3) To fill the lungs with air the diaphragm flattens out, pushing down on the stomach and liver. When the diaphragm relaxes it returns to its original position, assisting in pushing out the air from the lungs.
- g. What are some factors that unfavorably affect breathing?
- (1) A flat, poorly developed or injured chest.
 - (2) The presence of infected adenoids.
 - (3) Sinus infections and common colds.
 - (4) The habit of shallow breathing.
- h. What effort does the body make to keep the air passage-ways clear?
- Coughing—A noisy expulsion of air from the lungs caused by an irritation of the upper part of the larynx. Coughing can force irritating substances and foreign bodies out of the trachea and throat. When a foreign body accidentally gets into the trachea choking may result. Usually the foreign body is food that gets into the trachea but sometimes

it may be safety pins, marbles, pencils, buttons, etc. If a person is unable to expel foreign bodies by coughing, a physician should be called immediately.

2. What are the respiratory diseases?

- a. Many germs enter our bodies through the respiratory tract. Respiratory diseases are those which affect the nose, throat and lungs. The germs pass from the nose and throat of an infected person to the nose and throat of another by coughing, sneezing, spitting, or blowing the nose without properly covering the nose and mouth.
- b. Some of the respiratory diseases are the common cold tuberculosis, whooping cough, diphtheria, influenza and pneumonia. (Unit XIX)
- c. One can prevent the spread of respiratory diseases by covering the nose and mouth with a handkerchief when sneezing, coughing, and blowing the nose; washing the hands frequently and using an individual towel, wash cloth and drinking cup.
- d. Infected nasal sinuses are often the source of chronic respiratory trouble.

B. What is the work of the blood?

1. The work of the blood is to support life. If too much blood is lost unconsciousness and death result.

a. What is the composition of the blood?

- (1) Plasma—The straw colored liquid part of the blood, which is mostly water, carries digested food materials, dissolved waste materials and protective substances, and floating red and white corpuscles.
- (2) Red corpuscles—Carry oxygen to the cells of the body. A small drop of blood contains millions of them and give the blood its characteristic color. They appear like round flat coins depressed in the center of the broad surface.
- (3) White corpuscles—Defenders of the body by attacking germs. They are larger than red corpuscles and a cubic millimeter of blood normally contains from 6,000 to 10,000 of them.
- (4) Platelets—Aid in forming clots to check bleeding from cuts. They are tiny round bodies, smaller than red corpuscles and not so numerous.
- (5) Antibodies—Help to protect against disease. They are substances which aid in building up resistance, or immunity, to disease. The production of certain antibodies can be stimulated by the use of serums and vaccines.

b. What substances does the blood transport to the cells of the body?

- (1) Oxygen—In the red corpuscles is a substance called hemoglobin which unites with oxygen in the lungs and carries it to the cells. Hemoglobin must have iron in order to combine with oxygen. Oxygen gives hemoglobin a bright red color. When the hemoglobin gives up its oxygen to the cells it combines with carbon dioxide which is carried back to the lungs and is given off as waste. Carbon dioxide gives hemoglobin a dark purplish red color.
- (2) Digested food materials—They are absorbed into the blood stream from the small intestine and carried to the cells of the body which take from the blood stream the food they need.
- (3) Water — As blood circulates around the body, the plasma passes through the thin walls of the capillaries and bathes the cells in the water they need and supplies them with food. Water containing dissolved waste materials finds its way back into the blood stream. A considerable amount of the water is eliminated from the body by the kidneys, the sweat glands of the skin and from the lungs in the air one exhales. Water losses are replaced by the water drunk and the foods eaten. Water is absorbed by the blood from the stomach, small intestine and large intestine.
- (4) Regulators of growth and development—The blood transports vitamins to the cells along with other digested foods. The blood also transports secretions from the ductless glands which affect growth and development.
- (5) Protectors against disease — White corpuscles attack germs that get into the blood stream, and by changing their shape can pass through the walls of the capillaries and attack germs elsewhere in the body. Presence of infection in the body causes the number of white corpuscles to increase.

Antibodies in the blood either make it difficult for germs to multiply or weaken them so that the white corpuscles may devour them. Substances may be introduced into the body by vaccination against some diseases, such as smallpox and typhoid fever, stimulating the production of antibodies.

When germs grow they produce poisonous substances known as toxins. To combat this the body produces antitoxins which neutralize toxins. Antitoxins can be produced in the bodies of animals and then trans-

ferred to the human body to combat disease, such as diphtheria, scarlet fever, and meningitis.

When the body's defenses against disease are strong enough to prevent the disease from developing one is said to be immune. (Unit XIX.) When the body's natural defense is strong enough to prevent a disease from developing it is called natural immunity. Body resistance to disease may be strengthened by a good diet, sufficient exercise, rest and sleep, plenty of fresh air and sunshine, and personal cleanliness.

Individuals who suffer once from a disease may acquire an immunity that protects them from later attacks of the same disease; this is commonly called acquired immunity. By the use of vaccines and anti-toxins one may acquire immunity from certain diseases without having to suffer from the disease itself.

c. What substances does the blood transport away from the cells?

- (1) Carbon dioxide—A waste gas formed by the oxidation of food in the cells. It is dissolved in the blood, carried to the lungs and given off in the process of expiration.
- (2) Organic waste and water—Waste materials, resulting from the breaking down and wearing out of body cells and from the process of metabolism in the cells, dissolved in water, find their way from the cells and tissues to the organs of the body and are eliminated through the skin, from the kidneys, from the lungs and from the intestinal tract. (Unit VIII)

C. How does the circulation of blood contribute to fitness?

1. The circulatory system is composed of two parts, the swift moving blood stream and lymphatic system.

a. What is the work of the blood stream?

(1) Blood makes a complete circulation through the body in less than a minute through a network of blood vessels.

(a) Arteries—Tough, elastic vessels which carry blood away from the heart. The aorta is the largest artery of the body. When the heart contracts it forces blood into the arteries which causes them to expand and when the heart relaxes the pressure in the arteries becomes less and they contract. This contraction and expansion of arteries can be felt and is known as the pulse.

- (b) Capillaries—Small connecting vessels between arteries and veins. The arteries subdivide and become smaller and smaller until they are tiny hair-like thin walled tubes. The exchange of oxygen and carbon dioxide takes place here. The plasma passes through the walls and carries food to the cells and waste materials away from the cells. White corpuscles also pass through these walls to attack disease germs.
- (c) Veins—Vessels carrying blood back to the heart. The tiny capillaries join until they get large in size and are then known as veins. The walls of veins are neither so tough nor so elastic as are arteries because there is not much pressure. Veins contain tiny valves which aid in keeping the blood flowing toward the heart.
- (d) Heart—A pear-shaped, hollow, muscular organ that normally contracts seventy to seventy-five times per minute to force blood to all parts of the body. It is located in the chest cavity slightly to the left of the center line. The heart is divided into four chambers, the upper two called the auricles and the lower two, the ventricles. From a large vein, the vena cava, the right auricle receives the dark carbon dioxide laden blood from the body, contracts and forces this blood into the right ventricle. The right ventricle then contracts forcing the blood through a large artery to the lungs where the blood receives oxygen and returns to the left auricle through a large vein. The left auricle then contracts forcing the blood into the left ventricle. The left ventricle contracts and forces the blood into the large artery known as the aorta and thus the blood begins its journey around the body. The heart is provided with valves to keep the blood from flowing backwards. The heart is capable of responding to body needs by increasing its rate of contracting as the need for oxygen and food in the body increases.

b. What is the lymphatic system?

- (1) When the blood plasma passes through the walls of capillaries it is then known as lymph. The lymph surrounds the cells, supplies them with oxygen and food products, and removes waste materials from the cells.
- (2) Some of the lymph returns to the veins through the walls of the capillaries; the remainder returns to the blood stream through another set of tubes which forms

the lymphatic circulation. Tiny lymph capillaries join with large lymph vessels and in this way all of the lymph in the body is collected and emptied into a large vein just before it enters the right auricle of the heart.

- (3) At intervals along the lymph vessels are the lymph glands, which are more numerous in regions of the body where infections are the most common, such as the neck and jaw, armpits, groin, and chest. These glands act as filters, straining out germs that have entered the body allowing the white corpuscles to destroy them. Swollen lymph glands indicate the presence of infection in the body.
2. Good circulation contributes to health.
 - a. It maintains a continuous supply of food and oxygen to the cells.
 - b. It makes possible the prompt removal of wastes from the cells.
 - c. It makes possible the supply of extra power when extra effort is needed.
 3. Some facts to consider in the care of the heart are:
 - a. Heart disease was the leading cause of death in the U. S. in 1943 with a rate of 318.3 per 100,000 population.
 - b. A damaged heart will force one to refrain from too much activity.
 - c. Persons recovering from contagious diseases should have proper care in order to prevent heart ailments that may follow.
 - d. Proper exercise is necessary to maintain an efficient heart.

SECTION FOUR

NUTRITION

Suggested Time: Thirty-three Class Periods

- Unit VI. What Are the Food Essentials Man Must Include in His Diet? (Eight Class Periods)
- Unit VII. How Is Food Prepared by the Digestive Process So That It Can Be Utilized for the Health of the Individual? (Seven Class Periods)
- Unit VIII. How Are Waste Materials Eliminated from the Body? (Four Class Periods)
- Unit IX. How Can Lack of the Essential Foods in the Diet Affect the Body? (Five Class Periods)
- Unit X. What Digestive Disturbances Affect Modern-day Society? (Four Class Periods)
- Unit XI. What are Some of the Problems Associated with Food? (Five Class Periods)

OVERVIEW

The types of foods consumed by individuals are often determined by custom, cost, availability, ease of preparation, appeal to the eye and other factors, with little or no thought as to the contribution they can make to the growth and development of the body. With this thought in mind, the Seven Basic Food Groups have been stressed and referred to throughout the section. Familiarity with the use of these groups will enable the pupils to know that sufficient quantities of essential foods are being obtained for the proper growth and development of the body. These Seven Basic Food Groups are expressed in a simplified form to enable the pupil to visualize and recognize the quantity and type of food required each day.

Foods high in nutritional value are not necessarily expensive foods. By intelligent buying, proper planning of meals, and careful preparation and preservation of food the individual may be supplied with the necessary food essentials regardless of his economic status.

The proper functioning of the digestive process is influenced by many factors any one of which may bring about a digestive disturbance. The practice of desirable health habits in relation to consumption of food, elimination of wastes, exercise, proper mental attitudes, and sleep and rest will do much in promoting better digestion.

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UNIT VI

WHAT ARE THE FOOD ESSENTIALS MAN MUST INCLUDE IN HIS DIET?

Suggested Time: Eight Class Periods

OBJECTIVES

- To develop an understanding of the direct effect of foods on growth and development.
- To know the food essentials, their sources and functions.
- To create a desire to improve one's diet by having a knowledge of the seven basic food groupings.

SUGGESTED ACTIVITIES

Recognize the Problem

- Discuss the prevalence of lack of food in Europe, China, and India.
- Bring pictures from newspapers and magazines to illustrate.
- Discuss effect on future generations.
- Discuss how lack of adequate food supply in foreign countries influences our diet?
- Report on lack of proper diets in the United States

Develop the Problem

- Develop bulletin board display of seven basic food groups.
- Illustrate experiment to detect presence of sugar, fat and protein, water and mineral.
- Evaluate adequacy of previous week's diet on the basis of the seven basic food groups. This should be an individual project carried out by each pupil.
- Examine a restaurant menu for one day and compare with seven basic food groups.
- Prepare special report on experiments with animals which have been deprived of a basic food.
- Study advertising of food products in relation to the facts about food contents and nutrition.

Evaluation

- Evaluate school lunch program on the basis of the seven basic food groups.
- Draw up a desirable menu for one week as a guide for home use on basis of seven basic food groups.
- Plan a garden from the standpoint of a complete vitamin supply.

TERMS AND CONCEPTS

- Ascorbic acid, balanced diet, carbohydrates, enriched foods, fats, "fortified margarine," minerals, niacin, proteins, riboflavin, seven basic food groups, six food essentials, solvent, starvation, thiamin, vitamins.

SUGGESTED CONTENT

A. Why does the body need food?

1. For growth and repair.
 - a. The rate of growth varies in each individual, and maximum growth is partly determined by hereditary factors.
 - b. Repair of worn cells and tissues takes place mostly during sleep and varies according to the general health of the individual.
2. To produce heat and energy.
 - a. Heat is necessary to maintain a normal body temperature of 98.6° F.
 - b. Every movement necessitates the using of energy as the body is never completely at rest. We are continually using energy. Only death stops all body activities.
3. To regulate and protect the body processes.
 - a. Regulation of body processes and elimination of waste materials is aided by water, mineral salts, vitamins and bulky foods.
 - b. Protection is afforded against some diseases by vitamins and mineral elements.

B. What are the essential foods, their sources and functions?

1. Carbohydrates (starches and sugars)
 - a. What are the sources of carbohydrates?
 - (1) Starchy foods include bread, cereals, macaroni, spaghetti, rice, and potatoes.
 - (2) Examples of common sugars are cane sugar, beet sugar, maple sugar, and molasses.
 - b. What are the functions of carbohydrates?
 - (1) To provide the individual with quick energy for the body functions and activities.
 - (2) To provide the body with heat.
2. Fats
 - a. What are the sources of fats?
 - (1) Examples of animal fats include butter, lard, eggs, and fish oils.
 - (2) Examples of vegetable fats include coconut oil, corn, cottonseed oil, linseed oil, olive oils, and nuts.
 - b. What are the functions of fats?
 - (1) To provide a reserve energy for the body.
 - (2) To provide the body with heat. (Weight for weight, fats furnish twice as much heat as carbohydrates.)

3. Proteins

a. What are the sources of proteins?

- (1) Living tissues (meats, fish, and poultry)
- (2) Special storage by nature for the development of new life (milk and eggs)
- (3) Seeds of plants (nuts, legumes, cereals, and grains)

b. What are the functions of proteins?

- (1) Body growth (new cells created)
- (2) Cell repair (worn-out cells replaced; partly damaged cells repaired)
- (3) Energy (only rarely used for this purpose)

4. Vitamins

Note: The following are examples of some of the vitamins, the value of which has been determined. Further research may reveal new vitamins, and possibly new functions for the already known vitamins.

a. What are the sources of vitamins?

- (1) Vitamin A—Found in dark green leaves and yellow vegetables and meats.
- (2) Vitamin B.
 - (a) Thiamin—Found in enriched cereal products, meat, fish, poultry, eggs, and dairy products.
 - (b) Riboflavin—Found in eggs, milk, enriched cereal products, vegetables, fruits, nuts, and liver.
 - (c) Niacin—Found in enriched cereal products, meat, fish, vegetables, eggs, milk, fruit, and nuts.
- (3) Vitamin C (ascorbic acid) — Found in citrus fruits, green leaves, potatoes, white turnips, and other fruits and fresh vegetables.
- (4) Vitamin D—Found in milk, fish liver oils, eggs, liver, cheese, fatty fish, and most important, the ultra violet rays in sunlight.
- (5) Vitamin E—Found in wheat germ oil and green leafy vegetables.
- (6) Vitamin K — Found in green leafy vegetables, egg yolks, and soy beans.

b. What are some of the functions of the vitamins?

Note: Vitamins provide no heat, energy, or material for growth and repair of tissue, nevertheless, they are essential for normal growth and health.

- (1) Vitamin A—Essential for normal development and upkeep of skin, mucous membranes of body organs, and the eyes.

(2) Vitamin B.

- (a) Thiamin—Essential to proper functioning of nervous system and release of energy from carbohydrates.
- (b) Riboflavin—Essential to growth.
- (c) Niacin—Prevents pellegra.
- (3) Vitamin C (ascorbic acid)—Essential for the normal development and maintenance of the intercellular substance of body tissues.
- (4) Vitamin D—Necessary for the development and growth of bones and teeth.
- (5) Vitamin E—Essential for the prevention of weakness of muscles, prevention of certain injuries to the nervous system and for prevention of sterility (inability to reproduce).
- (6) Vitamin K—Essential for the normal clotting of blood. This is mostly of medical significance.

5. Minerals

- a. What are examples of sources of some of the more common minerals?
 - (1) Calcium—Found in milk, cheese, cabbage, and turnip greens.
 - (2) Iron—Found in dried apricots, liver, oysters, turnip greens, and lean meat.
 - (3) Phosphorus—Found in barley, beans, liver, milk, poultry and soybeans.
 - (4) Iodine—Abundant in sea foods and iodized salt.
- b. What are the functions of the more common minerals?
 - (1) Calcium and phosphorus—Responsible for strength and rigidity of bone and teeth.
 - (2) Iron—Essential part of hemoglobin which is the oxygen carrying substance of the red corpuscles of the blood stream.
 - (3) Iodine—Necessary to the thyroid gland which regulates the release of energy.

6. Water

- a. What are the sources of water?
 - (1) Drinking water supplied by springs, wells, rivers, and lakes.
 - (2) All foods contain varying amounts of water. An ordinary diet provides approximately two-thirds of the adult needs for water.

b. What are the functions of water?

- (1) Acts as a solvent.
- (2) Necessary to body cells to carry out their functions.
- (3) Acts as a cleanser inside and out.
- (4) Basis for all fluids in the body.
- (5) Aids in regulating body temperature.

C. What is a simple way of insuring that the dietary needs are met each day?

Note: It is suggested that the teacher stress the seven basic food groups to insure that the pupils become aware of a simple means of determining whether they are receiving a balanced diet. Not one meal, but the type of food consumed over a long period of time is the basis for determining the adequacy of the diet.

1. Seven basic food groups (Include foods from each of the following groups each day.)
 - a. Group I—One serving per day of green and yellow vegetables; some raw, some cooked, frozen or canned.
 - b. Group II—One serving per day of oranges, tomatoes, grapefruit, raw cabbage, or salad greens.
 - c. Group III—Two or more servings per day of potatoes and other vegetables, and fruits.
 - d. Group IV—One and one-half pints of milk per day as a minimum and milk products. (Enriched for children.)
 - e. Group V—One serving of meat, poultry, fish per day; at least three or four eggs per week, one egg per day is preferable.
 - f. Group VI—Three or more servings per day of bread, flour, and cereals. (Natural grain or enriched.)
 - g. Group VII—Butter or "fortified" margarine (vitamin A added). May be used for spreads and seasoning as the supply permits.

UNIT VII

HOW IS FOOD PREPARED BY THE DIGESTIVE PROCESS SO THAT IT CAN BE UTILIZED FOR THE HEALTH OF THE INDIVIDUAL?

Suggested Time: Seven Class Periods

OBJECTIVES

To know the organs of digestion.

To gain an understanding of how chemical and physical processes work together in the digestive process.

To know the sources of digestive juices and the type of food on which they act.

SUGGESTED ACTIVITIES

Recognize the Problem

Show by illustration how the law of conservation of matter and the law of the conservation of energy apply to the human body.

Use a locomotive or an automobile for illustrative purposes.

Compare common foods with the texture of the skin, and point out how they differ as to relative weight, color, texture, and ability to function.

Question: If eaten, how can this particle of food be transformed into a part of the body?

Develop the Problem

Have several individuals of the class chew a cracker thoroughly and report to the class as to the change in the taste and the action of the tongue in chewing.

Use wallcharts or models of the digestive system in discussing the path of food through the digestive tract.

Take a piece of starch. Test for sugar with Fehling's solution. Use a similar piece of starch, place in saliva and then test for sugar with Fehling's solution.

Evaluation

Draw a diagram of the digestive organs and label each.

Make a chart showing the sources of the digestive juices giving the location of each secreting gland or organ and the digestive effect of each juice.

TERMS AND CONCEPTS

Absorption, alimentary canal, appendicitis, assimilation, bile, colon, defecation, digestion, esophagus, food substance, gall bladder, gastric juices, intestinal juices, large intestine, liver, masticate, metabolism, oxidation, pancreas, pancreatic juice, peristalsis, rectum, saliva, salivary gland, small intestine, stomach.

SUGGESTED CONTENT**A. What is digestion?**

1. The process of preparing food materials for absorption and use by the body.
2. Foodstuffs change to a liquid form which enables food to be absorbed by the blood stream through the walls of the intestine and carried to the cells of the body.

B. What is the alimentary canal?

1. A continuous tube approximately thirty feet long with special adaptations to perform special functions.
 - a. Mouth
 - b. Esophagus
 - c. Stomach
 - d. Small intestine
 - e. Large intestine (colon)
 - f. Rectum

C. What are the functions of each part of the alimentary canal in the digestion of food?**1. Mouth**

- a. The tongue and cheeks aid in chewing food by placing foodstuffs in position for the teeth to crush and grind (mastication).
- b. The salivary glands pour saliva into the mouth where it is mixed with the food while the teeth masticate it.
 - (1) Saliva makes the food soft and moist which aids in swallowing.
 - (2) Dissolves the food so that it can be tasted.
 - (3) It rinses and cleans the mouth, and prevents accumulation of food which may indirectly cause tooth decay.
 - (4) It moistens and lubricates the cheeks, tongue, and lips thus aiding in speech.
 - (5) Saliva begins the digestive process by changing starch into simple sugars.

2. Esophagus

- a. Food is swallowed by aid of the tongue and muscular action in the back of the throat. This action pushes food into the esophagus.
- b. A wavelike contraction (peristalsis) of the esophagus forces the food into the stomach.

3. Stomach

- a. Contracting and relaxing of the muscle walls mixes the food with gastric juices secreted by glands located in walls of the stomach.
 - (1) Gastric juices act on proteins and curdle milk.
 - (2) Gastric juices destroy some harmful bacteria.
- b. Food is slowly pushed through the stomach and into the small intestine by peristaltic action.

4. Small intestine

- a. Three digestive juices are secreted into the small intestine, completing the preparation of foodstuffs so that they can be utilized by the cells of the body.

- (1) Bile from the liver acts on fats.

- (2) Pancreatic juice from the pancreas acts on fats, carbohydrates, and proteins.

- (3) Intestinal juices from the walls of the small intestine act on proteins and sugar.

- b. The changing of food to a soluble state is now completed.
- c. Food passes through the walls of the small intestine into the blood stream (absorption) and is transported to all parts of the body.

The cells of the body take the digested food from the blood stream (assimilation). By combining the digested food with oxygen (oxidation), the energy is released and is used for body activities, growth and repair (metabolism).

- d. The undigestible part of the food continues through the small intestine (by peristalsis) and enters the colon (large intestine).

5. Large intestine

- a. Absorbs water from the waste material.

- b. Prepares the residue for elimination.

- c. The appendix is located near the point where the small and large intestines meet.

- (1) Has no known function.

- (2) Provides a place for decay of food by action of bacteria which may cause inflammation (appendicitis).

6. The rectum serves as a storage place for waste materials until the time of elimination (defecation).

UNIT VIII

HOW ARE WASTE MATERIALS ELIMINATED FROM THE BODY?

Suggested Time: Four Class Periods

OBJECTIVES

- To know the organs of elimination and the particular function of each.
- To know the proper habits for the elimination of wastes.
- To recognize some of the factors affecting the elimination of waste materials.
- To appreciate some practices which aid in maintaining the efficiency of the excretory organs.

SUGGESTED ACTIVITIES

Recognize the Problem

Discuss: What happens to a furnace if the ashes (waste materials) are not removed? How are the gaseous products of combustion removed?

Develop the Problem

Discuss: Why do garments that have been "sweat-soaked" have white stains after drying?

Locate the organs of excretion on an anatomical chart.

Bring newspaper and magazine clippings showing some advertisements of so-called "aids to elimination." Discuss them from a practical health standpoint.

Have students exhale breath on a cold mirror and examine for water vapor. Note that the water vapor disappears. What is the origin of the water vapor and why did it disappear?

Evaluation

Prepare a general set of health rules which will aid in maintaining efficiency of the excretory system.

TERMS AND CONCEPTS

Abdominal cavity, bladder, carbon dioxide, colon, dermis, epidermis, evaporation, excretion, excretory system, laxative, mineral salts, nitrogenous substance, patent medicine, perspiration, sweat glands, urea, urethra, urine.

SUGGESTED CONTENT

- A. What are the excretory organs of the body and their excretions?
 1. Kidneys—Excrete mineral salts and nitrogenous substances dissolved in water.

2. Large intestine—Excretes mineral salts, waste products from the liver, food residue and some water.
 3. Lungs—Excrete carbon dioxide and water.
 4. Skin—Excretes mainly water and a small amount of mineral salts.
- B. What is the location and function of the excretory organs and some good health practices relating to them?
1. Kidneys are the two organs situated in the small of the back, one on each side of the spinal column, and attached to the back wall of the abdominal cavity.
 - a. They are directly connected by means of a large artery and vein to the main arteries and veins of the body, and an exceptionally large amount of blood passes through them.
 - b. This large amount of blood in the kidneys passes to the excretory cells which take from the blood nitrogenous substances (urea) and water (urea and water form urine).
 - c. Urine is transferred by ducts to the bladder.
 - d. The bladder is the storage place for urine; as it fills, the nerves in its wall are stimulated causing it to contract and the urine passes through a duct (urethra) to the outside. (Three to four pints of urine are excreted each day.)
 - e. The amount of urine excreted depends upon:
 - (1) The amount of water intake.
 - (2) The rate of evaporation of perspiration.
 - (3) Factors which influence blood pressure (causing more or less blood to pass through the kidneys).
 - (4) Water content of foods consumed.
 - (5) Drugs.
 - (6) General health of the kidneys. (Injured or diseased kidneys may increase or decrease the production of urine.)
 - f. Some good health practices to maintain efficient kidneys are as follows:
 - (1) A well-planned diet, based on the seven basic food groups, will provide necessary food elements and will not overburden the kidneys.
 - (2) Sufficient water is necessary to cleanse the kidneys and dilute the urine. (Drink at least six glasses of water each day.)
 - (3) Appropriate clothing should be worn to prevent chilling. (This allows sweat glands to aid kidneys in elimination of wastes.)
 - (4) Moderate exercise to keep the body in good tone.
 - (5) Patent medicines to aid the kidneys should be avoided. (A physician should be consulted in all cases when the kidneys do not function properly.)

2. Large intestine is the lower portion of the alimentary canal, located in the abdominal cavity, and empties into the rectum from which waste materials are defecated.
 - a. Waste materials of the large intestine include:
 - (1) Undigestible foods and foods partly digested.
 - (2) Small amounts of digestive juices.
 - (3) Bacteria and some of the products of their action.
 - (4) Water.
 - b. Waste materials are pushed along the large intestine by a wavelike contraction (peristalsis).
 - c. As waste material enters rectum, one has a desire to defecate (empty the intestine and rectum of their contents).
 - d. Some factors which affect excretion from the intestine include:
 - (1) Worry, fear and nervousness.
 - (2) Diet, posture, exercise, habits of defecation, water and laxatives.
 - e. Some good health practices to aid intestinal excretion are:
 - (1) Maintain good posture to keep the digestive organs in line and give them plenty of room to work.
 - (2) Get plenty of exercise to keep the stomach muscles in good condition.
 - (3) Select a proper diet, based on seven basic food groups, to provide enough bulk food to stimulate the action of the intestine.
 - (4) Wear clothing that is not too tight. (Belts, corsets, etc., if too tight may restrict action of the intestine.)
 - (5) Drink at least six glasses of water per day.
 - (6) Make a habit of emptying the intestine at a regular time each day.
 - (7) Avoid the use of laxatives.
 - (a) The walls of the intestine may be injured.
 - (b) The intestine may become lazy and depend on laxatives.
 - (c) There may be a serious loss of body fluids.
3. The lungs are two elastic, sac-like organs situated in the chest cavity which have a common passageway through the wind-pipe, mouth and nose for their waste products to pass to the outside.
 - a. The lungs are composed of many tiny air sacs into which the capillaries allow the carbon dioxide to pass through the walls of the air sac (by osmosis) in exchange for oxygen. Carbon dioxide is produced when the cells of the body oxidize digested food.

- b. When the air is exhaled, the warm carbon dioxide gas carries some moisture with it (evaporation) as it passes through the windpipe and nose.
 - c. Factors which affect excretion from the lungs are: exercise, temperature and humidity of the air, disease and obstruction of the passageways to the lungs.
 - d. Some good health practices to aid excretion from the lungs are:
 - (1) Good posture enables the lungs to work more easily.
 - (2) Deep breathing allows more of the inner surface of the lungs to operate.
 - (3) Periodic medical examinations to detect any disease that might affect the lungs. (Unit II)
 - (4) Practice of safety rules to prevent injury or obstruction to the breathing apparatus.
 - (5) Exercise to increase the capacity and strength of the lungs.
4. The skin covers the entire body for the protection of the body and also aids in the elimination of wastes.
- a. The skin is essentially composed of two layers.
 - (1) Epidermis—The outside layer is composed of dead cells for the protection of the under layer.
 - (2) Dermis—The under layer which is composed of living cells, contains nerves and blood vessels.
 - b. Excretion from the skin takes place through sweat glands which are seated deep in the dermis.
 - c. The main purpose of sweat glands is to aid in the control of body temperatures by excreting water (perspiration) which contains a very small amount of dissolved mineral salts.
 - d. Some factors that affect excretion of perspiration are:
 - (1) Temperature and humidity of the air.
 - (2) Exercise.
 - (3) Water content of the body.
 - e. Some good health practices to aid excretion by the skin are:
 - (1) Drink at least six glasses of water per day.
 - (2) Bathe frequently so as to keep the sweat glands from becoming obstructed by dirt particles.
 - (3) Avoid use of "skin food" creams as they may clog the sweat glands and cause infections. (Unit XIV)
 - (4) Wear appropriate clothing.

UNIT IX

HOW CAN THE LACK OF ESSENTIAL FOODS IN THE DIET AFFECT THE BODY?

Suggested Time: Five Class Periods

OBJECTIVES

- To realize that the lack of a well-balanced diet causes malnutrition.
- To become aware of some of the symptoms of malnutrition.
- To create a desire to intelligently choose foods that meet the daily requirements of food essentials.

SUGGESTED ACTIVITIES

Recognize the Problem

Bring to class pictures of people, cut from newspapers and magazines, who you think do not have characteristics of an average person. **Why?**

Discuss: "Children from homes of poor economic means are the only children who suffer from malnutrition."

Develop the Problem

Use pictures of people, cut from newspapers and magazines, and discuss what probable food deficiencies may have produced their condition.

Make a list of foods with high calorie content.

Make a list of foods with low calorie content.

Evaluation

Prepare a list of foods you would eat if you wished to gain weight; to lose weight.

Determine whether or not you are overweight or underweight by use of the tables for weight in relation to age, height and sex (twenty per cent above or ten per cent below average is considered within normal limits). (Unit I)

TERMS AND CONCEPTS

Anemia, beriberi, deficiency disease, fatigue, goiter, malnutrition, pellagra, rickets, scurvy, sterility, stimulant, vigor.

SUGGESTED CONTENT

A. What is malnutrition?

Poor physical condition brought about by not eating and digesting enough of the right kinds of foods for the needs of the body.

B. What are the chief causes of malnutrition?**1. Unwise selection of food.**

a. Lack of fuel producing foods (carbohydrates and fats).

b. Lack of tissue building foods (proteins).

c. Vitamin deficiencies. (Unit XIX)

(1) Vitamin A—Aids in the prevention of infection.

(2) Vitamin B:

(a) Thiamin—Aids in the proper functioning of the nervous system and prevents beriberi.

(b) Riboflavin—Lack of this vitamin causes growth to stop, loss of hair, soreness of the lips and tongue.

(c) Niacin (nicotinic acid)—Aids in the prevention of pellagra.

(3) Vitamin C (ascorbic acid)—Aids in the prevention of scurvy.

(4) Vitamin D—Aids in the prevention of rickets.

(5) Vitamin E—Aids in the prevention of sterility in some animals, but probably does not present a problem as far as human health is concerned.

(6) Vitamin K—Aids in the prevention of hemorrhages.

d. Lack of proper minerals in the diet.

(1) Calcium and phosphorus deficiency affects the structure of bones and teeth.

(2) Iron deficiency may cause anemia.

(3) Iodine deficiency may cause goiter.

2. Poor eating habits, such as, eating at irregular times, and overindulging in the use of coffee, tea and other stimulants.

a. Eating between meals and at irregular times tends to overwork the digestive organs and as a result impair their functioning.

b. Stimulants tend to cause a quickening of the body processes and energy is used up rapidly.

3. Diseased tonsils and teeth.

Poisons produced by organisms tend to affect the digestive organs and impair the digestion of food.

4. Overfatigue—Caused by too much activity and too little rest and sleep.

Waste materials caused by activity are more easily removed from the body during rest and sleep. Lack of sleep will cause an accumulation of waste materials and impair the function of body organs.

C. What are some general symptoms of malnutrition?

1. Thinness (underweight).
2. Fatness (overweight) with flabby muscles.
3. Lack of mental and physical vigor.
4. Coarse and rough skin and hair.
5. Coated tongue and foul breath.
6. Decayed teeth and foul breath.
7. Flat chest.
8. Irritability and nervousness.

D. What are some good health practices which may prevent malnutrition?

1. Diet based on the seven basic food groups.
2. Avoid use of stimulants such as coffee and tea.
3. Avoid overfatigue. Get plenty of rest and sleep.
4. Get sufficient exercise in the fresh air and sun. (Beware of sunburn.)
5. Consult a physician concerning any symptoms of malnutrition that may be recognized or any continued digestive disturbance that occurs. (Unit II)

UNIT X**WHAT DIGESTIVE DISTURBANCES AFFECT
MODERN-DAY SOCIETY?**

Suggested Time: Four Class Periods

OBJECTIVES

- To know some of the common digestive disturbances.
- To be able to recognize symptoms of digestive disturbances.
- To learn health rules which will aid in the prevention of digestive disturbances.

SUGGESTED ACTIVITIES**Recognize the Problem**

Discuss whether it is of more value to the human system to eat three large meals a day, or five small meals a day.

Discuss: "What is one man's meat is another man's poison."

Discuss: "Animals eat, man eats, only the man of intellect knows how to eat."

Develop the Problem

Discuss the prevalence of appendicitis and have pupils who have had appendicitis report on the symptoms they experienced.

List on board some factors observed by pupils that are not conducive to good health in the school lunch room, and take positive steps through the student council to correct any discrepancies.

Discuss: Why should one not engage in vigorous activity directly following a meal?

Make a list from reference books of some of the allergies and foods that cause them.

Evaluation

Prepare a program for auditorium presentation depicting the wrong and then the right way of enjoying a meal (include the serving of food, conversation at table, surroundings, etc.).

TERMS AND CONCEPTS

Allergy, appendicitis, belching, constipation, cramps, diarrhea, halitosis, heartburn, indigestion, nausea, overeating, ulcer, vomiting.

SUGGESTED CONTENT

A. What are some of the common digestive disturbances?

1. Allergy to food—A sensitiveness of the body to certain foods, that when eaten, result in abnormal reactions. Reaction may show up as a rash on the skin, headaches, nausea, etc.
2. Appendicitis—Inflammation of the appendix. The appendix is located in the lower-right section of the abdomen near the junction of the small and large intestines.
3. Belching—The ejection of gas from the stomach through the mouth.
4. Constipation—A condition in which defecation is difficult and infrequent.
5. Diarrhea—A liquid condition of bowel movements occurring more frequently than normal.
6. Halitosis—A foul or offensive condition of the breath caused by the faulty digestion of fats.
7. Heartburn—A burning sensation in the region of the heart caused by acid flowing back from the stomach into the esophagus.
8. Indigestion—A condition of incomplete or difficult digestion.
9. Nausea—A feeling of a need to vomit.
10. Ulcer—An open sore other than a wound.
11. Vomiting—The process of emptying the contents of the stomach through the mouth.

B. What are some of the symptoms of digestive disturbances?

1. Some of the symptoms of digestive disturbances are loss of appetite, bad taste in the mouth, belching of gas, cramps in the abdomen, nausea, vomiting, and diarrhea.
2. The symptoms of digestive disturbance may indicate a serious disease of the body which demands medical attention, or more frequently may indicate a disturbance of the function of the digestive tract, which if repeatedly occurring may also demand medical attention.

C. What causes digestive disorders?

1. The physical character of the food is responsible for symptoms of digestive disorders in many people. Food is more digestible and nutritious if it is appetizing, and served and eaten under pleasant conditions.

2. The nervous system affects digestion in two ways:
 - a. It may stimulate or retard the secretion of digestive juices.
 - b. It may increase or decrease the muscular contractions of the intestinal tract.
 3. Fear, pain, anger, and other strong emotions may prevent the secretion of digestive juices and in this way interfere with the digestion of food.
- D. How can digestive disorders be prevented and the health of the individual be improved?
1. Come to meals with an even temperament.
 2. If tired, arrange for a rest before meals. (Fatigue interferes with the digestive process.)
 3. The meal should be appetizing. (Influenced by method of preparation of food, variety of food, cleanliness of utensils for cooking and eating, types and appearance of vessels in which food is served, and trimmings placed on foods.)
 4. The surroundings should be attractive and the dining room quiet.
 5. Eating should be slow, and the food thoroughly masticated. (Digestion begins in the mouth.)
 6. Liquids should not be used to carry food from the mouth to the stomach. (Avoid ice water, particularly on an empty stomach, as it stops the flow of digestive juices.)
 7. Pleasant conversation and a leisurely attitude should prevail at the table.
 8. Leave the table with a feeling that you could eat a little more. (Overeating overworks the digestive system.)

UNIT XI

WHAT ARE SOME OF THE PROBLEMS ASSOCIATED WITH FOOD?

Suggested Time: Five Class Periods

OBJECTIVES

- To know the causes of food spoilage and some factors of preservation that aid in the prevention of spoilage.
- To gain an understanding of some of the methods of preparing food and their effects on food.
- To develop an appreciation for the value of proper preservation and preparation of food.

SUGGESTED ACTIVITIES

Recognize the Problem

Place a piece of fresh bread that has been exposed to the air in a container. Keep the container closed and at school room temperature for forty-eight hours. Examine for mold. Gently remove some mold with a knife and place on a glass slide. Observe under microscope. Draw a picture of what you see.

Discuss: "If the American kitchen sink had a stomach, heart and lungs it would be the best fed animal in the world."

Develop the Problem

Develop a bulletin board display depicting the various methods of preserving food. List various ways of preparing food and show the effects on vitamins and minerals.

Evaluation

Check preserved foods at home. Look for swollen and leaking cans or jars, and for the presence of mold. (Be sure to discard the contents of swollen and leaking cans or jars.)

Make a poster showing the relationship of cleanliness and good food preparation habits to the possibilities of illness from food.

TERMS AND CONCEPTS

Acid foods, bacteria, cold storage, cool storage, decay, dehydration, fermentation, molds, nutritive value, preservatives, quick freeze, refrigeration, spoilage, tapeworm, transmit, undulant fever.

SUGGESTED CONTENT

A. What causes foods to spoil and what methods are used to prevent spoilage?

1. Molds, yeasts and bacteria cause most of the destructive changes which develop in food in the form of fermentation in carbohydrates and decay in protein-rich foods.

2. Preservation of foods is attained by the following methods:

a. Regulation of temperature.

- (1) Low temperatures are utilized for cool storage (refrigeration) and cold storage (including quick freeze). Low temperatures inactivate bacteria but do not kill them. In cool storage the food is kept at approximately the freezing point of the food, and can be kept for weeks and sometimes months.

Apples, oranges and bananas are kept by this method. Cold storage utilizes temperatures at 20° F. or lower, and the temperature of the food is reduced quickly. Food can be kept for months. Poultry, meats, fish, berries, and various vegetables can be kept in this manner. Quick freezing retains more of the nutritive value of food than any other process of preservation.

- (2) High temperatures are used in the canning process by boiling, steaming without pressure and steaming with pressure. Pressure cooking of foods is the most efficient method of canning. High temperatures preserve foods by killing destructive organisms in the food, as a result food preserved by high temperatures can be kept many months. All nonacid vegetables and meats should be canned by the pressure method as extreme high temperatures are necessary to kill certain bacteria that cause severe poisoning (botulism). Canned foods must be protected against the entry of destructive organisms after the canning process is completed.

- b. Regulation of moisture—Drying (dehydration) is an ancient method of preserving food and is still used extensively for fruit, vegetables, fish and some meats. Destructive organisms need moisture in which to grow; drying removes the moisture and thus prohibits the activity of these organisms.

- c. Addition of chemical preservatives—This process includes the use of smoke for fish and meats; salt for preserving vegetables, meat and fish; vinegar for preserving vegetables, meat and fish; spices for meats, vegetables, fruits and fish; sugar in a concentrated form for dried fruits; and chemicals for preserving and coloring such foods as dried fruits (sulphur gas) and catsup (benzoate of soda). Chemicals kill some destructive organisms and prohibit the growth of others.

B. What are some of the factors which affect the loss of food value?

1. Effect of temperature—Vitamin A, thiamin and particularly vitamin C are destroyed by combining with oxygen. The higher the temperature, the faster the combining process takes place, hence more food value is lost if food is exposed to the air.
2. Effect of soaking—Any nutritive substance which dissolves in water will quickly pass from food to the water during soaking. All sugars, all minerals, vitamin C, thiamin, riboflavin and niacin dissolve in water. Dehydrated foods should be soaked only in the amount of water they can absorb plus a little extra for cooking purposes.
3. Effect of peeling, slicing, chopping and crushing—This brings about a tremendous loss of food value because the amount of surface exposed to the air is increased. If food must be chopped, sliced, or crushed, it should be done only when the food is thoroughly chilled.
4. Effect of cooking—The destruction of vitamins by heat is in proportion to the length of time food is heated. Vitamin A and vitamin C are harmed by the presence of oxygen so food containing vitamin A and vitamin C should not be stirred while cooking. The greatest loss comes from cooking foods and discarding the liquid. The best method of cooking is one that cooks food in the shortest possible time and which demands the least water.
5. Effect of salting—The time of salting can affect both the food value and taste of the food. If food is to be cooked without water add salt just before serving, if to be cooked in water add salt to water before cooking.
6. Effect of soda—This causes a rapid destruction of vitamin C, thiamin, riboflavin, and niacin. Soda should never be added to cooking vegetables and it should be avoided in baking if possible.

C. What are some rules for retaining the nutritive value of foods?

1. Purchase only the amount of fresh food which can be kept in the refrigerator.
2. Avoid peeling fruits and vegetables if possible. (The greens of some vegetables are very nutritious and should not be discarded. Example: Beet greens and apple peelings.)
3. Prepare salads just before serving.
4. Wash all foods quickly, do not soak in water (except dehydrated foods).
5. Foods kept in refrigerator should be covered and stored dry.

6. Reheat canned foods in the liquid in which they were canned.
7. Do not stir air into foods while cooking.
8. Do not add baking soda to vegetables.
9. If foods are to be boiled, put them into water which is already boiling and raise temperature to boiling as quickly as possible.
10. Use the shortest cooking method and heat foods quickly.
11. Start cooking frozen foods before they have thawed.
12. Serve frozen fruits immediately after they have thawed, if they are to be served without cooking.
13. Do not overcook.
14. Do not throw away liquid in which foods have been prepared, use it for gravies, sauces, and soups.

D. What are some illnesses that can be traced to foods?

1. Illness due to chemical substances normally present in some foods—mushroom poisoning is an example of the most familiar of these illnesses. Certain types of mushrooms are edible, but one should not pick and eat mushrooms unless sure they are of the edible type. Cooking has no effect on this type of poison.
2. Illness due to chemical substances, which may be accidentally introduced into foods. Cooking does not affect this type of poison.
 - a. Highly acid foods (tomatoes and rhubarb) should not be stored in aluminum utensils. Glass is preferable.
 - b. Chemical sprays used to control insects on plants may not be completely removed in washing.
 - c. Silver polish (particularly any containing cyanide) may not be completely removed after cleaning silverware and food may be poisoned.
 - d. Sprays used indoors to eliminate flies, ants, and mosquitoes may poison foods. All food should be covered while using sprays.
 - e. Poisons to control rats, mice and insects should never come in contact with food.
3. Illness due to food itself being contaminated.
 - a. Illnesses of this type transmitted from man to man, are traced to careless habits in regard to food, such as, not washing hands after going to toilet, returning a tasting spoon to food without washing it, licking fingers during food preparation and during meal, and insanitary food handling. Some of the diseases transmitted in this man-

ner are diphtheria, scarlet fever, tuberculosis, the common cold, and typhoid fever. Cooking can prevent these diseases if good sanitary measures are practiced.

- b. Some animal diseases transferred to man through food are undulant fever, tapeworm, and trichina worms. Pasteurization of milk and thorough cooking of meats, particularly pork, will aid in preventing these diseases.
 - c. Diseases are caused by improperly canned foods in which bacteria grow and produce a poison. Foods that cause their metal container to swell, glass jars to leak around the cap, or that have a peculiar odor should not be tasted or used.
4. Illness due to the individual being sensitive (allergic) to a particular food. Certain foods cause definite reactions in some people. Examples of some symptoms of allergies caused by being sensitive to certain foods are hives, itch, and sneezing. (Unit X)

PART 2

COMMUNITY EFFICIENCY FOR LIVING

**THE BODY'S CONTROL MECHANISMS
AND MENTAL HEALTH**

HEALTH PROFESSIONS AND AGENCIES

SAFEGUARDING THE INDIVIDUAL AGAINST DISEASE

SECTION FIVE

THE BODY'S CONTROL MECHANISMS AND MENTAL HEALTH

Suggested Time: Twenty-four Class Periods

- Unit XII. What Are the Control Mechanisms Which Provide for Adjustment to the Surroundings and Personal Problems? (Six Class Periods)
- Unit XIII. How Can Good Mental Health Provide for Adjustment to the Surroundings and Personal Problems? (Three Class Periods)
- Unit XIV. How Does Personal Appearance Affect Mental Health? (Six Class Periods)
- Unit XV. How Do Good Manners Affect Relationships with Others? (Five Class Periods)
- Unit XVI. How May Narcotics and Stimulants Influence Adjustment to the Surroundings and Personal Problems? (Four Class Periods)

OVERVIEW

The nervous system coordinates the action of all the body structures and systems discussed in Part 1 and, by means of regulators, such as the sense organs and endocrine glands, produces the human personality. Because the whole concept of personality is complex, the material presented to the junior high school pupil is as simple and concrete as possible, laying a foundation for further development in the senior high school. The one main objective is to present material which will best help the pupil to understand himself as he enters adolescence. The information on the endocrine system was particularly chosen with this purpose in mind.

Essentially, the suggested content of Units XII through XVI is personal adjustment to individual growth and to the community—its situations, problems and people. The development of mental health and personality determines the effectiveness of the adjustment. The success with which a community meets its problems of healthful living as they are presented in later sections, can be measured only in the degree of adjustment that its members are able to attain.

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Note: Several senior high school textbooks, for
 example: Goldberger and Hallock, Health and
 Physical Fitness, Clemensen and LaPorte, Your
 Health and Safety, and Wilson and others, Life
 and Health, will furnish much of the needed
 material on structure and function of the nerv-
 ous system, endocrine system and sense organs.

Sources of Free and Inexpensive Materials (See gen-
 eral bibliography for addresses of publishers)

Aetna Life Insurance Company

Posters and health article leaflets available on
 eyes, ears, and skin. Free.....Units XII, XIII

Bristol-Myers Company

Leaflets and good grooming guides for boys and
 girls. Free.....Unit XIV

Wall charts: Grooming for school. Individual
 charts for boys and girls. Free.....Unit XIV

John Hancock Mutual Life Insurance Company

Ears that hear.....Unit XII

Healthy eyes.....Unit XII

McKnight and McKnight

As others like you. 25c.....Unit XV

How do you do. 25c.....Unit XV

Test on manners for juniors. 10c.....Unit XV

Minnesota Dept. of Health

Guiding the adolescent. Free.....Units XII, XIII

Healthy, happy womanhood. Free.....Units XII, XIII

Keeping fit. Free.....Units XII, XIII

Understanding ourselves. Free.....Units XII, XIII

Write for list of materials on personal health and
human relations.

Visual Aids (See general bibliography for addresses)

Minnesota Department of Health

Endocrine glands. 11 min. 16 mm. sound. free..Unit XII

Film Preview

Courtesy comes to town. 2 reels. 16 mm. sound.

\$2.50Unit XV

How the ear functions. 1 reel. 16 mm. sound.

\$1.25Unit XII

University of Minnesota, Bureau of Audio-Visual
Instruction

Eyes and their care. 1 reel. 16 mm. sound. \$1....Unit XII

Hi slouch. 1½ reels. 16 mm. color. sound. free Unit XIV

How the eye functions. 1 reel. 16 mm. sound. \$1..Unit XII

How we hear. 1 reel. 16 mm. sound. \$1.....Unit XII

The nervous system. 1 reel. 16 mm. sound. \$1..Unit XII

The skin. 1 reel. 16 mm. silent. 75c.....Unit XIV

University of Wisconsin, Bureau of Visual Instruction

Eyes (elementary). 16 minutes. 16 mm. silent.

75cUnit XII

Skin. 16 minutes. 16 mm. silent. 75c.....Unit XIV

UNIT XII

WHAT ARE THE CONTROL MECHANISMS WHICH PROVIDE FOR ADJUSTMENT TO THE SURROUNDINGS AND PERSONAL PROBLEMS?

Suggested Time: Six Class Periods

OBJECTIVES

- To acquire a general knowledge of the function and structure of the nervous system.
- To appreciate the part the endocrine system plays in growth and development during adolescence.
- To recognize the sense organs as control mechanisms and analyze their primary structure and function.

SUGGESTED ACTIVITIES

Recognize the Problem

Compare the nervous system to a telephone system.

Illustrate by means of drawings how the eye and camera are similar.

Locate the different parts which constitute the nervous system from charts and pictures in your health texts.

Name all the impulses which have been carried to your brain in the last five minutes.

Develop the Problem

Select a committee or person to visit a meat market and obtain a calf's brain. Bring it to class, dissect, and locate the cerebrum, cerebellum and enlarged portion at upper end of the spinal cord (medulla).

Try to find out which part of the tongue is most sensitive to each taste by using salt, sugar, vinegar and a bitter substance.

Explain why the brains of two tiny babies are more nearly alike than those of two five-year-old children.

Name several reasons why a person who has been reading or studying feels rested if he goes outdoors and plays.

Discuss the characteristics of adolescence in relation to the knowledge gained about the endocrine system.

Evaluation

Give an oral report explaining why one encounters difficulties of coordination when first learning a new skill.

Draw a diagram of the body and trace a reflex action and a voluntary action.

Prepare an oral report explaining why physical health is so intimately tied up with mental health.

Prepare a paper on the actions of the nervous system; explain why the simple reflex is a safety device, and also how it might cause an accident; analyze the voluntary acts done consciously every day which should be habitual.

TERMS AND CONCEPTS

Adolescence, auditory nerve, automatic, autonomic, bony socket, brain, central nervous system, cerebellum, cerebrum, ciliary muscle, cochlea, conscious direction, coordination, cornea, crystalline lens, eardrum, endocrine, equilibrium, eyebrow, eyelash, gland, habit, impulse, inner ear, iris, liquid lenses, medulla, mental activity, middle ear, motor neuron, nerve, neuron, optic nerve, outer ear, ovaries, pineal, pituitary, power of accommodation, pupil, reflex action, response, retina, semicircular canal, sense organ, sensory neuron, sex glands, spinal cord, stimulus, taste bud, tear glands, testes, thymus, vital functions, voluntary actions.

SUGGESTED CONTENT

- A. What are the general functions of the nervous system and how do they provide for adjustment?
 1. The nervous system is the communication system of the body which connects all organs and structures of the body with one another. It controls bodily activities and thus enables them to work together efficiently.
 2. Through this communication system the body is able to help a person:
 - a. Keep informed and adjust to what is going on in the surroundings.
 - b. Use the power of thought.
 - c. Control and coordinate bodily movement.
 - d. Control the action of the internal organs.
- B. What are the parts of the central nervous system and how do they function?
 1. The nerves
 - a. The brain and spinal cord are connected with the rest of the body cells by nerves.
 - b. The connections are through messages called **impulses** which are started by **stimuli**. Such stimuli may originate outside the body (odor, light, sound) or inside the body (idea, thought, pain or hunger).
 - c. Action is brought about when an impulse reaches the brain from which a response is sent back to the muscles affected by the impulse or to a group of muscles which can carry out or relieve the impulse.
 - d. The nerve cell is called a neuron. Many neurons bound together are the actual nerves. For example: The neurons in the leg combine to form the leg nerves. There are two types of neurons, each of which can carry messages in only one direction.

- (1) The sensory neuron carries impulses to the brain where they are interpreted. Such impulses may come from the eyes, ears, nose, tongue, or skin which are known as sense organs because they are sensitive to only one kind of stimulus. For example: The nose is sensitive only to odors; the ears only to sound, etc.
- (2) The motor neuron carries impulses back from the brain, often down the spinal cord to a muscle which results in action. No muscle can move until it is stimulated to do so by an impulse from a motor neuron.

2. The spinal cord

- a. Composed of a cable of nerves which carry impulses, thus serving as a link between the brain and the nerves throughout the body.
- b. Center of reflex action, the simplest bodily action.

3. The brain

- a. The center of all mental activity and as such is the chief regulator of the nervous system.
- b. Consists of three main parts:
 - (1) The cerebrum which is the center of thinking, remembering and imagination. It receives all impulses that make us aware of the world outside of us.
 - (2) The cerebellum which controls muscular action and is the center of balance.
 - (3) The medulla which connects the brain to the spinal cord and regulates the circulatory, breathing and digestive activities. This is the part of the central nervous system which is automatic and not controlled by the brain.

C. How does the central nervous system direct behavior?

1. The simplest action one makes is the simple reflex.
 - a. Reflex action is emergency action and may aid the safety of the body.
 - b. Such an impulse goes only to the spinal cord and quickly bounces back without taking time to go up to or to receive conscious direction from the brain.
 - c. Example of reflex action is withdrawing the hand from a flame before thinking about it.
2. Voluntary acts require conscious direction from the brain.
 - a. The most difficult action the nervous system must perform is the execution of a new voluntary act requiring direction from the brain which involves several sets of muscles and neurons never before called upon to work together.
 - b. Coordination is the working of muscles and nerves in complete harmony in the execution of an action.

3. Through repetition some voluntary acts become habits.
 - a. The more often a particular impulse which involves the same sensory and motor neurons travels up to the brain and back (for example: eating, dressing, talking, walking) the easier it becomes for the neurons involved to carry out their job.
 - b. Through repetition the impulse gradually becomes automatic as far as actual direction on the part of the brain is concerned.
 - c. This is the way habits are formed.
- D. What part does the autonomic system play in the functioning of the nervous system?
 1. The autonomic nervous system located along side of the central nervous system, but composed of different neurons and nerves, regulates the vital functions of the body over which the brain has little or no control.
 - a. It controls messages to and from the internal organs.
 - b. It regulates the internal needs of the body. For example: When the stomach and small intestine need more blood to aid in digestion the blood vessels are stimulated to increase the circulation to these organs.
- E. What are the endocrine glands and how are they associated with personal problems?
 1. A gland is an organ whose cells separate certain materials from the blood and manufacture from them a chemical product. The products of the endocrine glands are absorbed directly into the blood stream and thus circulate throughout and affect the entire body.
 2. They are closely associated with the autonomic nervous system in acting as automatic internal regulators of body functions, particularly those associated with growth and development. Normal functioning of these glands provides a person with normal characteristics.
 3. The pituitary, thymus, pineal and sex glands are particularly active during adolescence, thus influencing this period of growth and adjustment between childhood and adulthood.
 - a. The pituitary gland (under the brain)
 - (1) Undersecretion results in stunting growth.
 - (2) Oversecretion results in giant build.
 - (3) Stimulates development, maturity and function of sex characteristics.
 - (4) Affects the contraction of muscles in blood vessels and intestines.
 - (5) Influences the formation of urine.

- (6) Exerts great influence on other endocrine glands and is thus called the "master" gland.
 - b. The thymus gland (behind breastbone, above heart)
 - (1) Regulates growth and development, particularly of other glands. No longer active as individual matures.
 - (2) Influences growth of the skeleton.
 - (3) Retards sex development until person has reached proper physical growth.
 - c. The pineal gland (in cerebrum) prevents the too early development of body and particularly the sex organs.
 - d. The sex glands (in males: testes, in females: ovaries)
 - (1) Influence the changes of adolescence.
 - (a) Development of breasts and body contour in girls.
 - (b) Change in pitch of voice and growth of beard in boys.
 - (2) Produce reproductive cells.
 - (3) Greatly influenced during adolescence by secretions of pituitary gland.
- F. What special parts of the body keep one aware of the happenings in the surroundings?
- 1. The nose, tongue and skin receive impulses from the surroundings.
 - a. The nasal passages admit air to the nerve center of smell located in the upper back part of the nose where an impulse is carried to the brain resulting in the sense of smell.
 - b. Taste buds on the tongue (which make it feel rough) relay the four kinds of taste—sweet, sour, bitter and salty—to the brain.
 - c. Nerve endings in the skin are sensitive to touch.
 - 2. Sensations of sound are carried to the brain through the ears.
 - a. What is the importance of normal hearing? (Unit I)
 - (1) Contributes to obtaining an education.
 - (2) Aids in making adjustments to life's situations.
 - b. What are the structures and functions of the parts of the ear?
 - (1) The outer ear shaped like a conch shell admits the sound waves through the ear canal to the eardrum.
 - (2) The middle ear, which contains three tiny bones called the hammer, anvil, and stirrup, transmits the vibration to the inner ear.

- (3) The inner ear consists of the cochlea and the semicircular canals. Stimulation of the hairlike processes in the cochlea sends impulses over the auditory nerve to the cerebrum resulting in hearing. The semicircular canals help in maintaining body equilibrium.
3. Many of the impressions of the outside world are received through the eyes.
 - a. What is the importance of good vision? (Unit I)
 - (1) Carries impressions of form, color and movement to the brain.
 - (2) Acts as one of the chief avenues of learning and enjoyment of life.
 - (3) Aids in protection from danger
 - b. What are the structures of the eye which work together to give clearness of vision?
 - (1) The outer layer of membrane covers the entire eyeball, part of which is known as the white of the eye. In front it bulges out slightly and is known as the cornea, through which light is admitted since it is transparent.
 - (2) The middle layer of the eyeball is dark due to pigment cells. It contains capillaries which nourish the tissues of the eye. In the front it is continuous with the iris which gives the eye its color besides having muscular action to regulate the amount of light admitted to the interior of the eyeball.
 - (3) The pupil is the opening in the iris for the admission of light; looks black because there is no light behind it.
 - (4) The retina is the inner layer of the eyeball which contains a network of nerve fibers sensitive to light. These fibers combine to form the optic nerve at the back of the eyeball which carries the stimulus of light to the brain.
 - (5) The crystalline lens is an elastic structure back of the iris which is controlled by a muscle. This ciliary muscle helps the lens adjust to light rays coming from far or near objects; the eye uses this means for focusing; such action is called the power of accommodation.
 - (6) Liquid lenses in front and in back of the crystalline lens aid the lens in directing light rays and also give the eyeball its shape.
 - (7) Six pairs of muscles (external muscles; three pairs in each eye) direct both eyes toward the same object and aid a little in focusing.
 - c. What are the accessory parts of the eye which give protection to the structures concerned with vision?

- (1) Bony socket into which the eye fits.
- (2) The eyelid which shuts involuntarily when anything comes toward the eye (reflex action).
- (3) Eyelashes filter dust and particles from the air.
- (4) Eyebrows shade eyes from overhead lights and keep out perspiration.
- (5) Tear glands continually secrete small amounts of fluid to both the eyes and keep them free from irritation.
- (6) Conjunctiva, mucous membrane, covers front of the eyeball and lines the eyelids.

d. How is the process of vision accomplished?

- (1) The lens receives the rays of light entering through the pupil and focuses them on the retina.
- (2) The pupil adjusts in size by the aid of the iris to admit the proper amount of light.
- (3) The receptors in the retina transmit impulses to the brain through the optic nerve.
- (4) The brain interprets the image.

UNIT XIII

HOW CAN GOOD MENTAL HEALTH PROVIDE FOR ADJUSTMENT TO THE SURROUNDINGS AND PERSONAL PROBLEMS?

Suggested Time: Three Class Periods

OBJECTIVES

- To recognize that sound mental health is largely dependent upon the nervous and endocrine systems.
- To realize the factors around which the development of personality and mental health are centered.
- To realize that mental health and emotional stability can be achieved through conscious effort.
- To gain the knowledge necessary for evaluating one's own mental health.

SUGGESTED ACTIVITIES

Recognize the Problem

Select some people considered successful in life who have "pleasing personalities." What personal traits do they have which helped them achieve their goals?

Discuss ways in which people differ from each other in meeting problems, making friends, getting things done and influencing others.

Develop the Problem

Name prominent people who have had to make adjustments in life because of physical defects.

Make a poster demonstrating the four factors upon which personal development depends.

Plan a class exhibit of the hobbies of different members of the class.

Put on a program centering around the interests of class members.

Dramatize the different social adjustments one must make in high school.

Make a list of the personality traits one looks for in people in each of the four areas of personal development.

Analyze your school subjects in relation to their contribution to the development of better recreational skills.

Evaluation

Write a personal evaluation of one's own mental health traits, making suggestions on the improvements which need to be made and how they might be accomplished.

TERMS AND CONCEPTS

Adjustment, attitude, constructive, deceit, demands of society, destructive thoughts, effective adjustment, ego, emotional conflict, emotional control, emotional development, emotional maturity, environment, guidance, handicap, heredity, ideals, inferiority, intellectual development, intelligence, personality, physical development, poise, self-confidence, social development, sulking, tantrums, thought substitution, vocational guidance, wishful thinking, worry.

SUGGESTED CONTENT

A. What is mental health?

1. Mental health is the condition of the mind which enables the individual to adjust to environment and personal problems effectively and satisfactorily in accordance with personal desires and the regulations and demands of society.
2. Each individual must establish his own behavior pattern; however, some characteristics can be found which are similar for all individuals.
 - a. A person with good mental health meets any difficult situation with the idea of doing his best to improve it.
 - b. The well-adjusted person finds contentment in daily tasks, play, school, church and home.
 - c. The well-balanced individual has poise and self-confidence, feels at ease with people.

B. How do the nervous and endocrine systems affect good mental health?

1. Mental health implies the satisfactory control of emotional reactions, as they are modified by the glands, to the situation or problem at hand.
2. The pathways established in the nervous system, that is the habits formed to control emotions and thoughts, determine the effectiveness of adjustments.
3. A nervous system trained to respond quickly and smoothly and an endocrine system that functions normally are essential to good mental health.

C. What are the four factors which together form the foundation of good mental health?

1. Intellectual development

- a. Heredity determines the limits of mental capacity but not the way it is used.
- b. Intelligence or mental capacity is reflected in thinking.
- c. Sound thinking takes place in definite steps: (Wilson and others, *Life and Health*, pp. 306-307)

- (1) Recognizing the question, problem or difficulty.
 - (2) Gathering related facts.
 - (3) Formulating possible answers or solutions.
 - (4) Analyzing the possibilities.
 - (5) Reaching a conclusion.
- d. Surroundings constantly demand response and adjustment and in this way influence the thinking habits which are acquired.
 - e. The importance of the effectiveness with which the mind is used in directing all mental activity cannot be overestimated.
2. Physical development
- a. A sound body provides a better chance for a healthy mind.
 - b. Physical handicaps and defects need not result in unhappiness if the person reasons sensibly about his handicap.
 - c. Development of a physically fit body results in greater personal and social satisfaction and promotes better success in life.
3. Social development
- a. Personal desires must be regulated by the best interest of society in general.
 - b. The key to good social development is sincere interest in others.
 - c. Ability to get along well with other people indicates that a person is "growing up" socially.
 - d. The family is the center of social life.
 - e. Social development requires setting up a satisfactory relationship with those in authority, those of the opposite sex, older people, younger people, and "followers," people of equal basis and members of the family.
4. Emotional development
- a. The underlying influence emotions play in meeting personal problems often is not realized. A fine balance must be recognized and maintained between the emotional and intellectual controls that "make the wheels go round."
 - b. One should constantly develop emotionally. Childlike tendencies must be replaced by mature reactions.
 - c. Emotional conflict develops when one is unable to adjust to the problem at hand thus not intelligently controlling his emotions.
 - d. Emotional control implies making an adjustment either through stimulating desirable emotions or curbing undesirable ones. Accepting disappointment without resentment

and substituting another attainable action in its place is a good example of emotional maturity.

- e. Emotional maturity also implies the establishment of attitude toward life that is wholesome and desirable, one which provides spiritual hope and faith for the future.
- f. Adolescence presents definite problems of emotional development. An adolescent should know why personal, physical and emotional characteristics are changing. (Unit XII)

D. How are mental health and personality related?

1. The sum of the four factors influencing the development of a human being—intellectual, physical, social and emotional—combine to form what is known as personality. Mental health and personality are alike in that the desirable development of both depends on all four factors working together efficiently. Personality is the manner in which we put our mental health into action.
2. A personality inventory with which to check one's traits (Fowlkes and others, *Success Through Health*, pp. 39-40):
 - a. Is interested in friends, games and hobbies.
 - b. Wants to find out about the world in which he lives.
 - c. Sticks to a thing.
 - d. Pays attention to the work he is doing.
 - e. Finishes tasks he has begun.
 - f. Is prompt in getting to work; does not put things off.
 - g. Is truthful.
 - h. Enjoys playing.
 - i. Enjoys working.
 - j. Forgets grudges quickly.
 - k. Controls emotions.
 - l. Shows courage in meeting disappointments.
 - m. Assumes his individual part in group undertakings.
 - n. Is willing to share what belongs to him.
 - o. Keeps hands off other people.
 - p. Works cheerfully even under trying conditions.
 - q. Is thrifty with time and materials.
 - r. Is orderly.
 - s. Can think himself out of a difficulty.
 - t. Faces problems squarely and tries to solve them.

E. What are the causes of poor mental health?

1. Letting worries occupy the mind during the greater part of the day only magnifies them to a point of desperation.
2. Putting things off that one dislikes but has to do generally brings poor results and a greater dislike for the situation.
3. Worrying or confused thinking in regard to a problem does not result in a solution of the problem.
4. Being suspicious of others is a sign that the person does not look into the situation as it is.

5. Making believe, wishful thinking, running away from problems or making excuses for a length of time are ways of ignoring the true state of affairs and is shutting out constructive thinking.
6. The constant repression of thoughts, desires, and emotions, results only in worry, nervousness and frustration and does not solve any problem.
7. Tantrums and sulking are engaged in only by the person who wants to have his own way.
8. Fear of failure and worry usually causes the person to do poorer work than if he faced the situation clearly.
9. Bad attitudes are often excuses for failure to consider other people.
10. Turning self-confidence into egotism and deceit is detrimental to self-respect.

F. What are the cures for poor mental health?

1. Substituting a good habit for an undesirable one, constructive thoughts for destructive, and work more suited for one's abilities and likes for work which one does poorly or dislikes.
2. Thinking about the welfare of others rather than constantly of one's self.
3. Talking over problems with friends, parents and teachers when necessary.
4. Looking ahead or planning so that a problem may be solved step by step.
5. Solving each problem as it presents itself rather than being overwhelmed by allowing many problems to pile up.
6. Trying again when an activity was not a success the first time. Trying to learn and benefit from defeat and disappointment.
7. Having that confidence which is the result of mastering each situation as it arises and knowing how to effectively use abilities and knowledge.
8. Developing pride and resolution in maintaining good character.
9. Overcoming handicaps by making the best use of individual talents.
10. Facing the situation as it is and not trying to side-step it.
11. Concentrating attention on studies or the job at hand.
12. Overcoming inferiority feelings by gaining definite skills and abilities.
13. Maintaining sound physical health.

G. How can youth lay a foundation for good mental health?

1. Forming high ideals and wholesome attitudes through a study of what constitutes worth-while activities, and by emulating the truly great people of today as well as of the past.
2. Forming friendships with people of all ages by being concerned for the welfare of others.
3. Participating in wholesome play, recreation and hobbies to relieve mental strains.

4. Participating in worth-while work that challenges ability to the highest degree consistent with good health, and also, if possible, work that is of service to others.
 5. Developing the capacity of solving minor problems by facing reality and then doing something constructive about it.
 6. Consulting people who will give sound advice when needed in times of strain or great crises.
 7. Setting up goals and striving to attain them.
 8. Developing the habit of cheerfully tackling each situation as it presents itself, thus clearing the way for the next.
- H. What may guidance and personal counseling programs offer which will aid adjustment?
1. Assistance in selecting high school course of study best suited to interests, needs and abilities.
 2. Information about vocational opportunities.
 3. Opportunities for personality and interest evaluation.
 4. Aid in solving personal problems arising during adolescence.
- I. What is the relation of recreation to mental health?
1. Recreation is what one does because he likes to do it, not because he has to do it. It is the natural expression of human interests seeking satisfaction. Such expression may be either active (tennis, swimming, ice skating) or passive (reading, music, mental games). There is a need and a place for both.
 2. Recreation may be found in organizations, in small groups of friends, in family circles and individually.
 3. Recreation skills can be developed in school activities and classwork.
 4. Recreation stimulates good mental health because such a natural mode of expression results in:
 - a. Relaxation of tired mental and physical processes.
 - b. Loss of "self" and problems in interest pursued.
 - c. Release of re-creative abilities.
 - d. Increase of skill in natural interests.
 - e. Integration of emotional and social poise.

UNIT XIV

HOW DOES PERSONAL APPEARANCE AFFECT MENTAL HEALTH?

Suggested Time: Six Class Periods

OBJECTIVES

- To realize that personal attractiveness depends greatly on the proper care of the skin, hair, and nails and on maintaining good posture.
- To coordinate into daily habits the proper care of the skin, hair and nails by obtaining knowledge of their structures and functions.
- To recognize a few basic principles of clothing selection and care.
- To become aware of grooming problems.

SUGGESTED ACTIVITIES

Recognize the Problem

Discuss: What are the factors that need to be considered in making a favorable impression? When is it important to make a favorable impression?

Develop the Problem

Draw a diagram of a cross section of skin and fill in and label each structure.

Look at a piece of epidermis, a fingernail and a hair under the microscope and make drawings of them as they appear.

Give a report on different skin allergies and how tests are given to determine them.

Find out what methods are used to control athlete's foot.

Prepare reports on: What causes falling hair?

Upon what factors does hair lustre depend?

Do tight hats cause baldness?

What makes hair curly?

Why do some people tan more than others?

Evaluate advertisements in newspapers and magazines of products sold for the care of the hair and skin.

Conduct an experiment with Petri dishes of sterile agar showing the number of bacteria found on clean, slightly soiled and dirty hands. What interpretations could be made from such an experiment?

For the Girls: Write out a morning and night routine for a week covering the care of the skin, hair and nails.

Demonstrate proper brushing and shampooing of the hair and manicuring of the nails.

In cooperation with the art or home economics department or a local beauty operator, put on a demonstration of hair styles pointing out the good and bad styles for the main facial types.

For the Boys: Demonstrate and practice how to shine shoes correctly.

Discuss the need for special care of socks and feet, especially if the feet perspire a great deal. Discuss care of the feet in relation to athletics.

Conduct a weekly inspection of shoes, socks, and feet.

Evaluation

Make a poster or write a paper bringing out in simple, concrete form the material in this unit which was of most value to you.

Discuss: How does care of the skin and hair actually depend on observing the rules for sound health?

Discuss: How much does personal appearance count?

Plan a "Neatness Day" for the entire school. Tag the pupils who meet the requirements of cleanliness and neatness in appearance. Place large mirrors and posters at the entrances to the school to make the pupils conscious of their appearance when they enter the school building.

TERMS AND CONCEPTS

Acne, allergy, athlete's foot, blackhead, boil, callus, carbuncle, cold sore, complexion, corn, dandruff, dermis, epidermis, fever blister, freckles, hair follicles, hair texture, hangnail, hives, mole, natural oil for the hair, nerve endings, oily hair, orangewood stick, perspiration, pigment, pimples, pores, ridges of the skin, sunburn, sweat glands, wart.

SUGGESTED CONTENT

A. How does care of the skin affect personal appearance and mental health?

1. The skin has several functions:

- a. Serves as a protective covering for the body.
- b. Aids in elimination.
- c. Regulates body temperature.
- d. Contains the sense organs for touch, heat and cold, pain and pressure.

2. The functions are carried out by the skin structure which consists of:

- a. Outer layer or epidermis composed of layers of cells; the inner layer of epidermal cells is alive and contains pigment or coloring matter which determine a person's complexion. Cells at the surface are dead and are rubbed off by clothing or bathing.
- b. Inner layer of dermis is made up entirely of live cells, blood vessels, nerves, oil and sweat glands and hair follicles.

- c. Oil glands (sebaceous glands) lie at the roots of the hair follicles. In each hair follicle is a single hair which projects from the epidermis. The oil (sebum), the natural oil for skin and hair, is secreted through the hair follicles.
 - d. Sweat glands filter liquid wastes from the blood to form perspiration which is excreted through tiny pores to the surface of the skin.
 - e. Nerve endings are present in ridges (papillae) which project outward from the epidermis. These ridges are especially noticeable in the palms of the hands and soles of the feet.
3. The health of the skin is influenced by the same factors important in maintaining the health of the rest of the body.
 - a. Cleanliness is essential for removing dead cells of the epidermis and oily dirt that has accumulated.
 - b. Nutrition is important since the skin is fed from within. Overeating of sweets, starches and rich fatty foods may often cause skin eruptions, especially during adolescence.
 - c. Exposure to sunshine produces vitamin D and kills bacteria.
 - d. Rest and fresh air also help give the skin a healthy texture.
 - e. Exercise insures adequate nourishment for the structures of the skin.
 - f. Clothing of the proper kind helps the skin carry out the functions of elimination and regulation of temperature. Frequent changes of clothing and frequent baths are important in guarding against body odor.
 - g. Proper elimination insures removal of wastes and toxins which interfere with the proper sanitation and nutrition of the skin.
4. The best procedures and times for washing and bathing are:
 - a. The hands, face, neck and ears should be washed with soap and water every morning and evening and as often in between as they are soiled.
 - b. The hands should be washed thoroughly with soap and water before eating or preparing food and after going to the toilet.
 - c. The ideal bathing rule is a bath or shower every day. If this is not possible, a warm bath with soap for cleansing the whole body thoroughly should be taken two or three times a week.
 - (1) A warm bath is most effective for cleansing the body and should be taken at bedtime as the blood vessels in the skin expand, drawing the blood away from the brain, often making one feel comfortably sleepy.
 - (2) A hot bath is a good type for one who is chilled. One must guard against chilling after the hot bath.

- (3) A cold bath is a tonic to the skin, making one feel alert. The blood vessels in the skin at first contract and drive the blood to the internal organs. One must guard against shock to the nervous system and chilling after the cold bath.
- (4) The shower can be either hot or cold. Soap should be used to dissolve the dirt accumulations on the skin and in the pores.
- d. Showers should include a thorough soaping and cleansing with warm water followed by a moderately cool shower. A shower should always be taken after exercise.
5. Abnormalities of the skin may result from lack of cleanliness or care, or irritation.
 - a. Pimples result from an oversupply of sebum or bacteria getting into the pores and along side the roots of hairs. Acne or chronic pimples often start during adolescence when activity of oil glands is increased. Cleanliness and sound health habits are its best preventive.
 - b. Blackheads may result from an accumulation of dirt in the pores or at the surface of the hair follicles. Best preventive is soap and water.
 - c. Warts are caused by a virus and often disappear without apparent cause.
 - d. Moles are groups of highly pigmented cells. They should be treated only by a physician and not by home care.
 - e. Athlete's foot, usually contracted near swimming pools or showers, is caused by a fungus. Careful drying of the feet, especially between the toes, will help prevent this infection.
 - f. Sunburn resulting from excessive exposure to the sun may be injurious as well as painful.
 - g. Cold sores or fever blisters are present in case of colds or fever; they should not be broken but dried out with alcohol or camphor.
 - h. Allergies occur in cases where the person is hypersensitive to certain substances such as foods, pollens, hair, wool and feathers. Hives indicate a sensitiveness to a particular food. Once the irritating substance is discovered it must be avoided.
 - i. Freckles are merely spots of pigment in the skin generally "brought out" by the sun.
 - j. Calluses and corns are due to rubbing or irritation of the skin in a localized area.
 - k. Eczema may be due to irritation, a diet problem (hypersensitivity) or nervous tension.
 - l. Boils are infections along a hair follicle caused by bacteria and aided by lowered body resistance. Carbuncles are the

same as boils but with several adjacent follicles infected. Both should be treated by a physician. Both may be spread from one part of the body to another or from person to person by contact, clothing, towels, etc.

B. How does the condition and care of the hair contribute to personal appearance and mental health?

1. Certain characteristics of hair, such as, its texture, color, straightness or curliness, are determined by heredity. Careful grooming of hair may turn inherited characteristics into assets in one's personal appearance.
2. Structure of the hair is important to know in order that it may be cared for properly.
 - a. Hair is an outgrowth of the outer layer of skin (epidermis).
 - b. Each hair is composed of three layers of cells.
 - c. Oil glands near each hair root keep the hair soft.
3. Care of the hair is essential for good grooming.
 - a. Oily hair needs to be washed frequently with a pure, mild soap to remove excess oil.
 - b. Whether oily or dry, hair should be shampooed whenever necessary to keep the hair and scalp clean. Careful rinsing to remove soap is important.
 - c. Frequent brushing of the hair will remove dust and dirt, distribute the oil more evenly and serve as a massage for the scalp.
 - d. Carefully combed hair is an essential of good grooming.
 - e. Frequent brushing and shampooing will remove the dead cells of the scalp which are combined with oil into flakes (dandruff).
 - f. Boys shampoo their hair more frequently than girls because it is shorter and a more simple procedure. Applying oil to the hair too abundantly should be avoided.
 - g. For the Girls: "Setting" the hair may be easily done by oneself or a friend. However, whether hair is cared for at home or in the beauty parlor, it should not be subjected to excessive heat (baking).

C. How is the appearance of the nails a factor in good grooming?

1. The functions of the nails are to protect the finger tips and to help in picking up objects.
2. Structure of the nails
 - a. An outgrowth of the epidermal cells; actually many hairs fused together in a horny plate.
 - b. Rest on ridges of papillae which are provided with many tiny blood vessels, giving it color.
 - c. New nail cells formed and pushed out at the root of the nail.

3. Care of the fingernails

- a. Cut to conform to the natural shape of the fingertips; long nails break more easily.
- b. Wash with warm soap and water and use nail brush; do not use sharp instrument to remove dirt.
- c. Shape at ends by filing or trimming with scissors or nail clippers.
- d. Use orangewood stick to gently push back cuticle.
- e. Press back hangnails, clip and then apply an antiseptic to prevent infection.
- f. Biting the nails brings bacteria to the mouth, is disagreeable to watch, leaves nails broken and jagged and is sometimes a sign of maladjustment due to nervousness. People who cannot stop this practice should seek medical advice.

4. Care of toenails

- a. Keep trimmed short and cut square, across the front.
- b. Cutting down corners may cause ingrown nails. This condition may also develop from poorly fitted shoes. Cutting a V-shaped notch in the center of the nail after it leaves the nail bed and placing tiny pads of absorbent cotton under the edge usually brings relief.

D. How does clean, neat, proper clothing add to personal attractiveness and comfort?

1. Clothing makes the body comfortable by regulating the flow of heat from the body.

- a. For cold weather one needs clothing that will keep a layer of warm air near the body surface. Wool and fur enmesh considerable air and are poor conductors of heat, hence aid in retaining body heat.
- b. Dark colors absorb light rays so are warmer than light colors. Light colored clothing absorbs fewer light rays so is cooler.
- c. Cotton and linen make cool clothing because of quick absorption of moisture and quick evaporation.
- d. Clothing made of rubber prevents normal evaporation so should not be worn too long at a time.
- e. Damp clothing conducts heat away from the body in evaporation; chilling may result.
- f. Outer clothing should be chosen according to the weather and not worn when indoors.
- g. Amount of exercise one receives should be considered in choosing the weight and amount of clothing to be worn.

2. Proper care helps the durability and appearance of clothing.
 - a. Underclothing and stockings should be changed every day as clothing worn next to the body is easily soiled by perspiration and retains odors.
 - b. Outer clothing should be washed or dry cleaned when needed and kept pressed to present a pleasing appearance.
 - c. Clothes will wear longer and look better if hung up whenever they are removed.
 - d. Clothes may be hung out to be aired to remove body odors and to increase their "life."
 3. Comfort, occasion, color and style of clothing all play a part in personal attractiveness.
 - a. Clothing that is loose is comfortable because it does not restrict circulation or bodily movement.
 - b. Party clothes and shoes are out of place at school or at work. One is more at ease and has poise when dressed properly for the occasion.
 - c. Sloppiness in dress indicates carelessness rather than cleverness.
 - d. Boys and girls may learn to choose the right type of clothing for height and weight. One is mentally at ease when wearing the right clothes for his build.
 - e. Color of clothing when chosen with color of hair, eyes and skin in mind, will greatly improve personal appearance.
- E. How does posture influence personal appearance and mental health?
1. The way the body is held, that is, one's carriage, creates the general impression unconsciously made on other people. Thus, the effect of personal appearance is largely dependent on posture. Posture also reflects mental attitudes such as self-confidence, disappointment, initiative, bashfulness, etc. and physical characteristics which include fatigue, energy, etc.
 2. The careful grooming of the hair and nails, the skillful selection of clothes and the healthful appearance of the skin can aid personal attractiveness only in the degree in which it is first influenced by good posture.

UNIT XV

**HOW DO GOOD MANNERS AFFECT RELATIONSHIPS
WITH OTHERS?**

Suggested Time: Five Class Periods

OBJECTIVES

To understand that manners are common courtesies to be observed every day in all situations.

To learn the manners which are observed in specific situations.

To realize that the use of good manners is an aid to mental health.

SUGGESTED ACTIVITIES**Recognize the Problem**

Discuss: Why do we use manners? What is their place in society today?

Discuss the specific situations where one needs to know the correct courtesies in order to avoid awkwardness and embarrassment.

Develop the Problem

Put on a series of skits depicting the right and wrong action at the dinner table, on the street, and in making and acknowledging introductions.

Discuss the courtesies one should observe when visiting for a few days in someone's home.

List many ways in which one can make other people feel at ease.

For the girls: Put on a simple tea, inviting teachers and parents, in cooperation with the home economics department.

For the boys: Discuss the sportsmanship code as it is observed in your school. Put on a pep fest centering about the observance of these courtesies.

Dramatize a formal dinner; diagram a formal dinner place setting.

Evaluation

Make a handbook for the high school stating the common courtesies which each student should know. Have it published in the school paper; illustrate it with informal cartoons.

Put on a "Good Manners" week with hall posters emphasizing specific courtesies, classes emphasizing the manners particularly associated with their subject matter and a school assembly featuring skits, movies and informal round table discussions concerning good manners and good grooming. Carry out one particular manner each day. Example: Sportsmanship at athletic contests, classroom manners, etc.

TERMS AND CONCEPTS

Acknowledgment, consideration, courtesy, greeting, interested listener, introductions, manners, politeness, sportsmanship.

SUGGESTED CONTENT

A. What constitutes good manners?

Manners are common courtesies, the outward expression of kindness and consideration for others. They are not used just on special occasions, but rather should be habits which are graciously observed every day in all situations. Manners, like dress styles, change but the same common traits of courtesy, sportsmanship and kindness are inherent in their practice.

B. What are desirable table manners?

1. Wash hands before going to table.
2. A man adjusts the chair for the lady at his left before seating himself and assists her in rising from the table.
3. Wait until all are seated and served before commencing to eat.
4. Avoid leaning on elbows while eating.
5. Use the words "please" and "thank you" to request food rather than reaching across the table or in front of someone for food.
6. Silverware is arranged in the order in which it will be used; follow the lead of the hostess in using the proper knife, fork or spoon.
7. Cut only one or two bites of meat at a time; do not break crackers into soup; break a slice of bread into several pieces and butter each piece as it is eaten.
8. When not using the knife lay it across the upper edge of the plate with the cutting edge toward the center of the plate.
9. Take part in conversation but avoid heated arguments or unpleasant or "personal" subjects. Learn how to be an interested listener.
10. Chew quietly; do not talk with your mouth full of food.
11. When finished place knife and fork side by side with the handles on the right side of the plate.
12. In eating soup dip the soup spoon away from you.
13. Eat all food on the dinner plate with a fork; when not using fork place it on plate with the tips of the tines up.
14. Do not push back your plate when you are finished.
15. Remain seated until all have finished eating.

C. What is the courteous way to introduce and meet people?

1. The name of a person to whom introduction is being made is always mentioned first.

Introduce.

- a. Younger person to an older person (Mrs. Clark, may I present Lois Jones?)
 - b. Man to a woman (Becky Thompson, this is Jack Jones.)
 - c. Young people to parents, teachers (Mother, I should like to introduce Jane Tibbs.)
 - d. Layman to a distinguished guest.
 - e. Two people of same age—either first.
 - f. An acquaintance to a friend.
2. Acknowledge an introduction by simply saying "How do you do, Miss Tibbs." Men shake hands when introduced to each other; women may if they want to. Never ignore an outstretched hand.
 3. These practices are also considered good usage:
 - a. Men rise when a lady, older man or prominent guest enters the room.
 - b. Men remove hats while talking to a lady and when entering a room.
 - c. Young women stand when being introduced to older women.
 - d. Men remain standing while others stand.
 - e. All stand for distinguished guests.
 4. Enter a room quietly without interrupting the conversation of those present; greet those present in a pleasant, courteous manner.
- D. What are good manners when meeting a friend or walking on the street?
1. Greeting a friend by name pleases him more than to be greeted "Hey" or "Say."
 2. Calling to a friend across the street or carrying on loud talking is unpleasant for others.
 3. Occupying the middle of the sidewalk while carrying on a conversation creates inconvenience for others.
 4. When walking with a lady, the man walks on the curb side of the street.
- E. Good manners at athletic games have been put into the following "Code of Sportsmanship"*

*Committee on Sportsmanship Code, University of Minnesota Association of Men in Health, Physical Education and Recreation.

SPECTATOR

1. I will applaud good plays made by either team.
2. I will consider our athletic opponents and their fans as guests and treat them accordingly.
3. I will consider the officials as the proper authorities to make decisions and will accept their decisions without demonstration.
4. I will cheer the entry of both teams on the playing field or floor.
5. I will do everything in my power to prevent heckling, booing, throwing of objects or other acts of discourtesy
6. I will support the team and coach regardless of the winning record of the team. I will consider the age, skill and experience of the teams' members as factors in winning. I will remember that good material is necessary for a coach to win games.
7. I will take pride in promoting good sportsmanship among the spectators, players and coaches and lend my wholehearted support to any program that strives for this.
8. I will attempt to become more familiar with the rules and fundamentals of the game in order to become a more intelligent and understanding spectator.

PARTICIPANT

1. I will consider my opponent as a guest and treat him as such.
2. I will give my opponent credit for high degree of skill when he wins and tell him so.
3. I will respect the decisions of the officials who are chosen because of knowledge of the rules of the game, their sense of fair play, and reputation in officiating.
4. I will accept the decisions of the officials without show or demonstration since they are in the best position to see the plays.
5. I will not hesitate if opportunity arrives to compliment the officials when I feel they have done fair and accurate work in a contest.
6. I will consider myself as a cog in a machine and as such will not sacrifice team play for individual glory. I will play to win fairly at all times.
7. I will cooperate willingly and completely with my coaches at all times.
8. I will remember that I am a representative of my school and as such will always play and conduct myself in such a manner as to be a credit to the student body whom I have been chosen to represent.
9. I will consider winning and losing contests as important but how we win or lose as much more important.
10. I will win without conceit and lose without alibi.

COACH

1. I will consider the opponents as my guests and treat them as such.
2. I will give the opposing coach credit for a job well done.
3. I will respect the decisions of the officials because they have been selected to work on the basis of proved skill, knowledge, and fairness.
4. I will accept the decisions of the officials without show or demonstration since they are in the best position to see the play. If I feel that they err, I will use regular and approved channels in protest.
5. I will not hesitate to compliment an official for a good job of officiating.
6. I will consider myself as a representative of the education profession and will conduct myself in such a manner as to be a credit to that profession at all contests.
7. I will by example and teaching set up the highest ideals, habits, and attitudes of fair play and conduct in the boys on my teams. I will demand this of my players in order to remain in the lineup.
8. I will do my coaching during practice week and not during contests.

F. How do you identify good manners in the classroom?

1. The courteous pupil will contribute to the discussion, be a good listener when others are speaking and express himself in correct English.
2. Being on time, being regular in attendance, having lessons prepared and participating in making the classwork interesting contribute to friendly group feeling.
3. Greeting teachers and classmates in the halls and on the street indicates friendliness on your part.
4. Boys always allow girls and adults to proceed them through doors and as they enter rows of seats.

G. What are good manners at public gatherings?

1. Speaking with a quiet and moderately pitched voice.
2. People at a play or movie prefer to enjoy them in their own way without interpretation or comment from members of the audience.
3. Show respect and consideration for others by being quiet and well-behaved.

H. What is the relation of good manners to mental health?

1. True courtesy shown to others indicates that a friendly feeling predominates.
2. Freedom from irritability is indicated when one does the accepted thing graciously.
3. Poise and self-confidence are attributes of the one who shows consideration for others at all times.
4. Consistently trying to do the right thing at the right time in contacts with people indicates good mental health.

UNIT XVI

HOW MAY NARCOTICS AND STIMULANTS INFLUENCE ADJUSTMENT TO THE SURROUNDINGS AND PERSONAL PROBLEMS?

Suggested Time: Four Class Periods

OBJECTIVES

- To determine the nature of alcohol, its uses and properties.
- To recognize how alcohol may be harmful to man and how it affects social contacts.
- To realize the harmful effects of coffee, tea and tobacco on young people.
- To gain a knowledge of the common narcotics and their effect upon the human body.

SUGGESTED ACTIVITIES

Recognize the Problem

- List the various ideas regarding the use of alcohol as a beverage.
- Discuss the use of narcotics by young people.
- Discuss: What are some of the problems which arise when an individual uses alcohol excessively?
- Discuss: Why do some high school students smoke?

Develop the Problem

- Compare by means of experiments the chemical action of absolute alcohol on common organic substances (vegetable oil, meat, sugar). Show solvent and dehydrating actions which make it useful in industry.
- Obtain some nicotine from a pipe which has been smoked and emptied; wipe the bowl out with a clean cloth or piece of cotton. Dissolve the nicotine by squeezing the cloth or cotton in some water. Put a small goldfish or a tadpole in the water. Put some nicotine on plant lice. Watch the results.
- Conduct an experiment using diluted alcohol (4 per cent) to show how alcohol interferes with the development of living tissue such as plants and germinating seeds.
- Give a report on the relation of the use of alcohol to safety.
- Prepare a bulletin board display showing the influence of alcohol on present-day living as revealed by the newspaper.
- Discuss the advertisements for the sale of tobacco that are broadcast and appear in newspapers and magazines.
- Give a report on the coffee and tea industries; include how coffee and tea are grown and prepared for use.

Review the familiar sayings about coffee (keeps me awake nights, etc.) and determine from them why it is harmful for young people.

Prepare a report on how the narcotic trade was brought under control in the United States.

Discuss the social and economic effects of opium addiction in China.

Evaluation

Make posters utilizing the information gained in this unit.

Write a paper discussing the effects of alcohol on the personality.

Prepare a talk for a Boy or Girl Scout troop or any similar organization on the use of tobacco and coffee by a high school student.

Determine what place narcotics have in our society today.

TERMS AND CONCEPTS

Addiction, alcohol, alcoholic beverages, caffeine, cocaine, codeine, coma, degeneration, depressant, distillation, drug addict, drunkenness, excessive fermentation, habit-forming, habitual use, heroin, injection, intemperate, intoxication, marijuana, moderation, morphine, narcotic, nicotine, opium, self-control, stimulant, stupor, waste product of yeast, will power.

SUGGESTED CONTENT

A. What are narcotics and stimulants?

1. A narcotic is a drug which in moderate doses allays sensibility, relieves pain and produces profound sleep, but in poisonous doses produces stupor, coma or convulsions. It is known as a depressant.
2. When drugs speed up cell activity they are called stimulants.
3. Both narcotics and stimulants are habit-forming drugs.
4. A person who cannot get along without a narcotic drug is known as a drug addict. His will power is weakened by the habitual use of a drug.

B. What is alcohol, how is it used, and what are its effects on the individual?

Alcohol is a narcotic drug classed by itself because of special problems involved in its use and sale. When present in medicines, the amount of alcohol must be stated on the labels as directed under the Federal Food, Drug and Cosmetic Act.

1. Alcohol is the waste product of the yeast plant and when used in the following ways is an aid to man.
 - a. A fuel which produces heat.
 - b. An aseptic to kill bacteria.
 - c. A solvent of drugs, varnishes, dyes and oils.

- d. An antifreeze mixture for automobiles.
 - e. A preservative for laboratory plant and animal specimens.
 - f. A substance for use in the manufacture of thermometers, artificial silk and films.
2. Alcohol is manufactured by a process of fermentation and distillation.
 - a. The fermentation of a sugar solution of fruit juice, grain or wood.
 - b. The distillation of fermented sugar from various starches.
3. Alcohol has the following properties:
 - a. Colorless.
 - b. Evaporates rapidly.
 - c. Combustible.
 - d. Characteristic odor and taste.
 - e. Preserves by absorption of water thus preventing growth of bacteria, molds and yeast.
 - f. Dissolves fats and oils.
 4. As a beverage alcohol often becomes harmful to man.
 - a. The taking of small quantities of alcohol in beverage form may not have any immediate ill effects. However, the habit of taking alcoholic beverages in moderation may lead easily to their immoderate use.
 - b. Alcohol does not cause organic damage of any cells in the brain or the rest of the body. It affects only the function of the cells as they are controlled by the central nervous system. The excessive use of alcohol may bring about:
 - (1) Nutritional deficiencies.
 - (2) Increased susceptibility to disease.
 - (3) Personality deterioration and mental defects.
 - (4) Loss of physical vigor.
 - c. The stages of intoxication brought about by the use of alcohol:
 - (1) First stage: The highest functions of the cerebrum are dulled; self-criticism is blunted; judgment and self-control are weakened; a tendency to talk more freely is noticed.
 - (2) Second stage: The sense of perception is dulled; the field of observation is narrowed; muscular coordination is weakened and clumsiness takes the place of precision often resulting in mishaps and loss of efficiency.
 - (3) Third stage: The control of locomotion and muscular movements are seriously disturbed; the ordinary symptoms of drunkenness are manifested.

- (4) Fourth stage: Stupor, unconsciousness, and coma result.
- 5. Alcohol, when used as a beverage, affects social contacts with people.
 - a. The loss of self-control may have the following results:
 - (1) Being a menace to oneself and others when operating an automobile or other machinery through impairment of general muscular control, increase of specific mental and physical hazards, nonobservance of traffic cautions and stop signs, collisions, and hitting of pedestrians.
 - (2) The possibility of acting in a manner offensive to others by becoming boisterous, talking aloud, laughing and becoming irritable and quarrelsome.
 - (3) The possibility of meeting with serious accidents when walking along the highways, at street and railway crossings or when exposed to cold.
 - (4) The possibility of being easily influenced to commit acts causing physical harm to other people, damage to property and expense to the community.
 - b. The possible impairment of other character and personality traits may occur.
 - (1) Self-respect—The lowering of the opinion of oneself; uncertainty in physical bearing and posture.
 - (2) Orderliness—Being less neat about the home and in one's work.
 - (3) Personal appearance—Resulting in poor grooming and slovenliness in dress.
 - (4) Initiative—Loss of ability to start new activities.
 - (5) Trustworthiness—Loss of confidence in one's sense of responsibility in work and social relationships.
- 6. Alcohol also affects the development of mental abilities.
 - a. Attention is weakened because of dizziness and "light-headedness."
 - b. Perception and memory disappear as restraint and self-control is depressed.
 - c. Learning is impossible when the cerebrum becomes paralyzed.
- 7. The sale of alcohol is regulated by the federal government.
 - a. Wilson Original Package Act, 1890, states that all liquor shipped into a state must conform to the laws of that state and is subject to the police powers and penalties in the same manner as any locally produced liquor.

- b. Reed Amendment, 1917 and 1919, prohibited the sending, soliciting, or advertising of liquor by United States mail in states where it was illegal to do so and provides penalty for violation.
 - c. Eighteenth Amendment, 1920, prohibited the manufacture, sale, and transportation of intoxicating liquors in any state or territory within jurisdiction of the Congress of the United States.
 - d. Twenty-first Amendment, 1933, repealed the Eighteenth Amendment.
 8. Many localities have a municipal liquor store in order to regulate the sales. Dealers are required to purchase state and local licenses.
- C. Why is it recommended that young people abstain from the use of tobacco?
 1. The harmful effects of tobacco, made from the leaves of the tobacco plant, come from the drug, nicotine.
 - a. Toxic effects clearly shown when dizziness, nausea and change of color of complexion are experienced the first time one smokes.
 - b. Experiments with animals show nicotine influences retardation of growth.
 - c. Effect on nervous system manifested in disturbance in heart action, circulation and breathing.
 2. Because of strain on organs and systems important in growth tobacco lowers personal efficiency in both work and play.
- D. What are some of the more common narcotic drugs and how are they a problem to society?
 1. Opium comes from the capsule of the poppy plant grown in China and India. Some of the purified drugs which come from raw opium are morphine, codeine, and heroin.
 - a. Morphine is is one of the most useful of narcotics to science and medicine.
 - (1) In small doses, deadens pain and produces sleep.
 - (2) May be taken by inhalation, tablets and injections.
 - (3) A morphine addict eventually becomes "skin and bones," eyes are sunken, digestive system is upset and has a fever. If the drug is taken from him, the addict becomes uncontrollable and may die.
 - b. Codeine has much less narcotic action than morphine and little addictive possibilities.
 - c. Heroin is more powerful than morphine. It is more rapid in its effects and the most dangerous addictive drug known.

- (1) Heroin addicts become insane more quickly and are more apt to commit crimes.
 - (2) Its manufacture and sale are outlawed in the United States.
2. Cocaine comes from the coca plant grown in South America.
 - a. As a medicine cocaine is able to block nerve conduction by local application. Its substitutes, procaine and novocain, have replaced it as they are nonhabit-forming.
 - b. As a drug it greatly stimulates the nervous system and the addict begins to overestimate his muscular and mental capacity.
 - c. Excessive use brings about hallucinations, mental deterioration, digestive disorders, emaciation and sleeplessness.
 - d. The drug may be taken by injection or inhalation of a cocaine powder commonly called "snow."
3. Marijuana or hashish (*cannabis indica*) comes from the Indian hemp plant.
 - a. Has no medicinal value as a drug.
 - b. Is either smoked as "reefer" cigarettes, chewed or drunk by the addict.
 - c. Affects the central nervous system and first brings on a dreamy existence which may produce either stimulation or depression. This may be followed by delirium, violence and mental deterioration.
 - d. Growth of the plant is hard to control because it may grow in almost any climate.
4. Results and prevention of addiction.
 - a. Weak, unstable personalities find experimentation in the use of narcotics leads to a habit over which they have little control.
 - b. Drugs give rise to an abnormal, undeniable craving satisfied only by more of the drug.
 - c. If supply is interrupted the addict may become insane. Attempts to satisfy his craving may lead to criminal acts.
 - d. Drug addicts need hospital treatment. Such treatment may be provided through the U. S. Public Health Service.
 - e. Drugs sold illegally are frequently smuggled into the country; addicts will pay enormous prices for the drugs they want.
 - f. Prevention can come only through education and law enforcement.
 - (1) Education will aid in preventing young people from the first ill-considered steps of addiction.

- (2) The Harrison Narcotics Act passed in 1914 limits the sale of narcotics to only the licensed manufacturers and druggists. Narcotics can be used only for the treatment of patients. Licensed doctors are the only persons allowed to prescribe them.

E. What attitude should be taken toward the use of coffee and tea?

1. Coffee comes from the bean of the coffee shrub or tree and originated in Arabia, while tea is the dried leaves of a shrub cultivated in China, Japan and India, and was first used in China.
2. Tea and coffee both contain caffeine which acts as a stimulant by:
 - a. Increasing the volume and rate of blood flow.
 - b. Increasing the output of urine.
 - c. Stimulating the nervous system.
3. There is no food value in coffee and tea except from the small amount of sugar and cream used.
4. When used by young people coffee tends to crowd milk, with its essential food elements, out of the diet.
5. All medical authorities agree that coffee drinking is harmful to children and youth who are still in the process of growing. Many in the medical profession agree that the habitual use of caffeine beverages in moderate amounts is not injurious to normal adults.

SECTION SIX

HEALTH PROFESSIONS AND AGENCIES

Suggested Time: Seven Class Periods

Unit XVII. What Are the Contributions of Professional People and Agencies Interested in Health? (Seven Class Periods)

OVERVIEW

The suggested content in this section is presented primarily to familiarize the pupil with the concept of public health functioning through the professions interested in health, through the school and through the community agencies. The material covered is necessarily brief and is merely an introduction to information covered in far greater detail in the senior high school health course (section six) and should be treated as such. Its importance lies in the fact that public health agencies serve as a link which connects the health of the individual, discussed in previous units, with the health of the community. The principal point for the junior high school pupil to realize is that numerous people and organizations are helping guard his personal welfare and that knowledge and use of their services are basic to individual and community efficiency.

BIBLIOGRAPHY

Pupil References (See general bibliography for addresses of publishers.)

SOURCES	PAGES
	Unit XVII
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Brownell and others, Training for living.....	181-188, 193-199, 209-218, 234-240, 242-246
Brownell and others, Adventures in growing up	383-384, 457-460, 472-476
Burkard, Working together for health.....	103-106, 121-125
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Crisp, Health for you.....	443-454
Fowlkes and others, Success through health.....	134-136, 260-266
Turner and others, Working for community health	13-18, 32-33, 71, 162-163, 180-183, 191-202
Wilson and others, Modern ways to health.....	163-172, 175-181, 185-187, 308-325, 335-338, 342-343

Library References for Pupils

Note: Consult local librarian for books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References (See general bibliography for publishers)

Note: The suggested content in the units of section six of the senior high school health course will furnish much valuable background material. The following senior high school textbooks will also prove helpful: Goldberger and Hallock, Health and Physical Fitness, pp. 315-337 and Wilson and others, Life and Health, pp. 490-508.

American Assn. of School Administrators, Health in schools....Unit XVII

Sources of Free and Inexpensive Materials (See general bibliography for addresses of publishers)

U. S. Public Health Service

Public health reports. Published weekly. Free.....Unit XVII

Note: Bulletins on the organization and function of agencies may be obtained from the agencies listed. It is sug-

gested that the state divisions of voluntary agencies be contacted whenever possible.

Visual Aids (See general bibliography for addresses)

University of Indiana, Extension Division

Your health department. 2 reels. 16 mm. sound. \$2.50.....Unit XVII

University of Minnesota, Bureau of Audio-Visual Instruction

Defending the cities' health. 1 reel. 16 mm. sound. \$1....Unit XVII

Hand in hand (Junior Red Cross). 1 reel. 16 mm. sound.

freeUnit XVII

Red Cross newsreels No. 4 and 5. 1 reel. 16 mm. sound.

freeUnit XVII

UNIT XVII

WHAT ARE THE CONTRIBUTIONS OF PROFESSIONAL PEOPLE AND AGENCIES INTERESTED IN HEALTH?

Suggested Time: Seven Class Periods

OBJECTIVES

- To recognize what health professions and agencies are effectively functioning in the community and through this knowledge determine the local health needs.
- To realize the contributions of the state and national agencies interested in health.
- To gain an understanding of how the individual may take part in the public health program.

SUGGESTED ACTIVITIES

Recognize the Problem

List the kinds and locations of the agencies and professional people interested in health which actively function in the community, state and nation. Discuss how they contribute to community and personal welfare.

Develop the Problem

- Invite the local health officer to speak to the class concerning his duties and to show the relationship between the official local, state and federal health governing agencies.
- Visit a hospital or clinic, if permission can be obtained, particularly noticing space, equipment, staff, etc. After the visit write an evaluation of the hospital's contributions and needs.
- Collect information about the health activities of the various service clubs and voluntary agencies in the community. Make a bulletin board display depicting this portion of the community health activities by using pictures, graphs, cartoons, etc.
- Carry out a Junior Red Cross activity and promote other Junior Red Cross activities in the different school departments.
- Ask a member of the County Public Health Association to tell the purpose of the Christmas Seal and how the money collected by its sale is spent in the community.
- Conduct a panel discussion on the contributions of the local governmental and voluntary health agencies by asking representatives of these agencies to participate in such a program centering around not only the present status but also future needs; or appoint committees to interview such representatives.

- Conduct the annual Christmas Seal and Red Cross campaigns in the school. Take an active part in the community campaigns if possible.
- Discuss why it is necessary to keep vital statistics and to have the census taken every ten years.
- Form a committee to interview the school superintendent or principal concerning the numerous contributions of the Minnesota Department of Education and the U. S. Office of Education to the health of the student.
- Write or visit the county Red Cross chapter to determine any county disasters in which the Red Cross has given relief and rehabilitation.
- Discuss the functions of the U. S. Department of Agriculture in providing an adequate food supply during the war and postwar periods.

Evaluation

Make a survey to determine the community health personnel, agency and sanitation needs. The following questions may serve as survey guides:

1. Is the number of physicians, dentists and nurses in the community adequate for the number of people served?
2. Are there enough hospitals and clinics and are they adequate in space and equipment?
3. Does the community have an adequate health department or health officers and do they perform their duties efficiently?
4. Does the school provide all the health facilities which are necessary for pupil development?
5. Do all restaurants, hotels and markets observe rules of sanitation in handling foods?
6. Are there health hazards that should be removed?
7. Would any new laws or ordinances in regard to health and sanitation help the community?

Prepare articles for the school or local paper setting forth an account of the interviews made, the class meetings and discussion held in connection with this unit, the services performed by the local health agencies. Tell also how the state and national agencies interested in health affect the community welfare.

TERMS AND CONCEPTS

Agency, clinic, communicable, county public health nurse, fraudulent, governmental agency, health council, health records, local health officer, nuisance, personnel, sanitation, tuberculin testing, vital statistics, voluntary agency.

SUGGESTED CONTENT**A. Local agencies and professions contribute to community health.**

1. What are the local agencies and professions which contribute to one's health status?
 - a. Professions: physicians, dentists and nurses.
 - b. Hospitals and clinics.
 - c. Governmental health agencies are supported by public funds and have the official authority to enforce regulations and laws.
 - (1) Local health department or local health officer
 - (2) Home demonstration and county agents
 - (3) Public schools
 - (a) Nurse and possibly a consulting physician or dentist
 - (b) Health director and council
 - (c) Health education classes
 - (d) Health examinations
 - (e) Health records
 - (f) Up-to-date health material in the library
 - (g) Dental health program
 - d. Voluntary health agencies are supported by donations, subscriptions, membership fees, etc., and have no official governmental authority for law enforcement. They supplement the work of the official agencies by promoting education and providing service.
 - (1) The County Public Health Association
 - (2) The American Red Cross, Junior Red Cross
 - (3) The Safety Council
 - (4) The Parent-teacher Association
 - (5) Volunteer agencies, such as, 4-H, Boy and Girl Scouts, Campfire Girls, American Legion, Legion Auxiliary, Rotary Club, Lions Club, Kiwanis Club, Chamber of Commerce and Junior Chamber of Commerce.
2. What are the contributions of some of the local health professions and agencies?
 - a. The contributions of the physician, dentist and nurse are:
 - (1) The physician performs examinations, makes recommendations for corrections, treats illnesses and performs operations. The oculist is a physician who has specialized in eye diseases and abnormalities. The health officer of each community is often a physician.
 - (2) The dentist performs dental examinations, corrects and repairs teeth.

- (3) The public health nurse gives nursing service in the homes, inspects school pupils, gives screening tests and carries on an educational program in the community giving lectures, demonstrations and conducting individual conferences. The nurse in the hospital may assist the doctor in examinations, treatment and surgery besides providing care for the patients.
- b. The hospital provides for those who are seriously ill, provides laboratory equipment necessary for making accurate diagnosis, provides facilities, equipment and nursing service for surgical treatment and may furnish the facilities for conducting clinics.
- c. Some of the many contributions of the local governmental agencies are:
 - (1) Local health departments and health officers control sanitation of the community through supervision of water, milk and food supplies, garbage disposal, elimination of nuisances, and enforce quarantine and isolation regulations in relation to communicable diseases.
 - (2) Home demonstration and county agents provide instruction and information on nutrition (canning, food preparation and conservation), crop planting and harvesting, and are active in the organization of rural folk groups. They may be called upon to speak at meetings or give demonstrations connected in any way with agriculture.
 - (3) The school is constantly contributing to the health and welfare of its pupils.
 - (a) The school nurse inspects pupils for symptoms of ill health, provides technical information and assistance to the teacher, arranges for examinations and clinics, and cares for those temporarily ill. County public health nurses may visit schools periodically, give tuberculin, sight and hearing screening tests and make arrangements for immunization.
 - (b) The health council is composed of faculty, pupil and community representatives interested in health and is under the leadership of the health director. It promotes and carries out functional health projects in the school as health examinations, immunization programs, healthful school living, school health instruction and also community health projects.
 - (c) School health records are kept for every pupil in Minnesota schools. The health card (Sr. H. S., Unit II) shows past history of disease, immuniza-

tion records, results of medical and dental examination and results of nurse and teacher observations and inspection.

- (d) The dental health program provides for a dental examination and correction of defects every school year.

d. The voluntary agencies make the following contributions:

- (1) The County Public Health Association sponsors the sale of the Christmas Seals in the county to raise money to aid the fight against tuberculosis. Some of the money used from the sale of these seals is returned to the school in the form of health education posters and pamphlets, first-aid supplies and tuberculin tests.
- (2) The American Red Cross, through a national organization, maintains local chapters to facilitate help in emergencies and to enlist membership and funds for the national program. The Junior Red Cross functions through the schools to acquaint pupils with the work of the Red Cross, in general, and in promoting production of material aids for children and adults in hospitals.
- (3) Parent-teacher Associations through their meetings acquaint parents with problems of health and safety relating to children, and promote health activities through summer roundups, clinics, etc.
- (4) Safety Councils promote pedestrian, auto and bicycle safety in the community. (Unit XXXVI)
- (5) Service clubs and organizations encourage health and safety projects; for example, the American Legion promotes the school safety patrol, the 4-H Clubs sponsor health projects and annually select a health king and queen. Many organizations develop summer camping programs.

B. State agencies regulate and promote health activities.

- 1. What are the health agencies of the state whose functions contribute to personal welfare?

a. Examples of governmental state agencies are:

- (1) Minnesota Department of Health
- (2) Minnesota Department of Education
- (3) Minnesota Department of Agriculture
- (4) Minnesota Department of Highways
- (5) Minnesota Fire Marshal

b. Examples of voluntary state agencies are:

- (1) Minnesota Public Health Association
- (2) Minnesota Safety Council

2. What are the functions of the governmental state health agencies?
 - a. The Minnesota Department of Health contacts the local health agencies mainly in a supervisory capacity. It performs the following functions:
 - (1) Sets up uniform standards relating to water and sewage sanitation, prevention of stream and lake pollution and nuisance control.
 - (2) Records vital statistics, such as, birth and death records and certifications.
 - (3) Supervises the sanitation of hotels, restaurants, summer resorts, boarding houses, hospitals, and rest homes.
 - (4) Promotes child and maternal hygiene.
 - (5) Controls communicable disease through regulations for isolation and quarantine of people who may communicate disease; also, by maintaining diagnostic laboratories, tabulating statistics for preventive information, conducting investigations in outbreaks of specific diseases and distributing specific drugs for preventive control.
 - (6) Conducts dental health program.
 - (7) Conducts state-wide health education program.
 - (8) Promotes industrial hygiene.
 - b. One of the functions of the Minnesota Department of Education is to set up a program to aid in attaining uniformity of the school health, physical education, and safety standards and curricula throughout the state.
 - c. Minnesota Department of Agriculture supervises agencies that handle food produce, enforces dairy and food laws, enforces weed inspection and enforces laws in regard to places where some foods are manufactured or sold.
 - d. Minnesota Department of Highways particularly promotes traffic safety by maintenance of well-constructed, maintained and patrolled highways and by educating the public in traffic safety in cooperation with the Minnesota Department of Education.
 - e. The Fire Marshal promotes safety by enforcing laws relating to fire prevention.
3. How do some of the voluntary state agencies contribute to health?
 - a. Minnesota Public Health Association conducts the state-wide Christmas Seal sale, tuberculin testing programs to discover tuberculosis cases early, and an annual posture campaign. It advises and supervises County Public Health

Associations. It promotes state-wide educational program for control of tuberculosis.

- b. Minnesota Safety Council promotes all phases of safety education by publishing educational material on accident prevention and statistics on accidents occurring in the state. Cooperates with Minnesota Department of Education in promoting safety.

C. Federal and national agencies also administer health functions.

1. What are the agencies which regulate health on a national scale?
 - a. Examples of governmental or federal health agencies are:
 - (1) U. S. Public Health Service
 - (2) U. S. Bureau of Census
 - (3) U. S. Office of Education
 - (4) U. S. Department of Agriculture
 - (5) U. S. Post Office Department
 - b. Examples of the voluntary health national agencies are:
 - (1) American Public Health Association
 - (2) American Red Cross
 - (3) National Tuberculosis Association
 - (4) National Safety Council
2. What are the functions of these federal agencies interested in health?
 - a. The U. S. Public Health Service seeks to prevent the spread of disease from state to state and from foreign countries to the United States; fosters public knowledge of common diseases; regulates the production of vaccines and other drugs; expends large sums of federal money through state health departments for research in and the control of tuberculosis and venereal diseases; and cooperates with federal, state and local health agencies.
 - b. The U. S. Bureau of the Census collects and compiles statistics on births and deaths.
 - c. The U. S. Office of Education is particularly concerned with the health of school children, hence promotes health instruction and healthful learning conditions in the schools.
 - d. The U. S. Department of Agriculture promotes the sanitary handling and storing of food supplies and the production of adequate food for the nation.
 - e. The U. S. Post Office Department sees that neither harmful substances (explosives, poisons) nor fraudulent claims concerning foods and patent medicines are sent through the mail.

3. What are the contributions of the voluntary national agencies concerned with health?
 - a. American Public Health Association acts in an advisory capacity to public health officials.
 - b. American Red Cross gives relief in great national or local disasters as earthquakes, floods, or epidemics; functions in time of war by providing blood plasma, aiding the wounded and sick, rendering services to members of the armed forces both overseas and here in the United States, providing surgical supplies, etc.; and conducts first-aid, water safety, accident prevention, nutrition and home nursing classes.
 - c. National Tuberculosis Association operates through its state and county associations to prevent tuberculosis through the maintenance of tuberculosis clinics, and through an educational program interesting the public in early diagnosis and proper care. The comparable organization on the state level in Minnesota is the Minnesota Public Health Association.
 - d. National Safety Council is interested in promoting safety on a national scale and cooperates with state and local councils in carrying on an effective program.

SECTION SEVEN

SAFEGUARDING THE INDIVIDUAL AGAINST DISEASE

Suggested Time: Twenty-nine Class Periods

- Unit XVIII. Who Is Responsible for Safeguarding the Human Body Against Disease? (Four Class Periods)
- Unit XIX. What Progress Has Been Made by Civilized Society in Controlling Disease? (Twelve Class Periods)
- Unit XX. Why Is It Necessary to Provide and Maintain a Pure Water Supply? (Four Class Periods)
- Unit XXI. Why Is It Necessary to Protect the Milk Supply? (Four Class Periods)
- Unit XXII. What Are Considered Satisfactory Methods of Removal and Disposal of Garbage and Sewage? (Five Class Periods)

OVERVIEW

The individual often loses sight of the fact that, as a member of society, he is partly responsible for the health status in the home, school and community as well as his own personal health. Each individual has his part in the program for personal and public health. Such health is dependent on the development of desirable attitudes, habits and practices for wholesome living and the prevention and control of disease.

The interest of individuals in health problems and the cooperation with public health agencies will produce high standards of sanitation and disease control measures. Immunization and testing programs, pasteurization of milk, purification of the water supply and proper sewage and garbage disposal are parts of a public health program to which every member of society is entitled.

Teachers may make a valuable contribution to safeguarding the individual by developing their powers of observation in the classroom in relation to pupils, recognizing any deviation from normal for the individual pupil and reporting the same to proper school authorities. "In cases of sudden sickness the school has responsibility for giving immediate care, notifying parents, getting pupils home and guiding parents when necessary to sources of treatment." (Health Education Council, Suggested School Health Policies, p. 19)

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Brownell and Williams, Training for living	42-50, 181-188	143-180			
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Note: Consult local librarian for additional books and magazines suitable for supplementary reading by junior high school pupils.

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American Assn. of School Administrators, Health in schoolsUnits XVIII, XIX
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 For the teacher and the administrator. (Single copy free if requested on official letterhead)....Units XVIII-XXII

Metropolitan Life Insurance Co.

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 Health heroes series. Free.....Unit XIX
 Curie Koch Reed
 Jenner Nightingale Trudeau
 Pasteur

Health through the ages. Free.....Unit XIX
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Minnesota Cancer Society, Inc.

Answers to common questions about cancer.
 FreeUnit XIX
 What everyone should know about cancer. Free..Unit XIX
 Youth looks at cancer. Free.....Unit XIX

Minnesota Department of Agriculture, Dairy and Food

Request available material on safe milk supply and pasteurization. Free.....Unit XXI

Minnesota Department of Health

- How do miniature X-ray surveys help in the control of tuberculosis. Free.....Unit XIX
- The teacher's part in the school and community health program. Free.....Units XVIII-XXII
- Request available material suitable for use with the units in this section.

Minnesota Public Health Assn.

- An appeal to leaders. Help find early tuberculosis. Free.....Unit XIX
- Ask me! Free.....Unit XIX
- How your body fights TB. Free.....Unit XIX
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- It's a wonderful feeling to know. Free.....Unit XIX
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Common colds. 5c.....Unit XIX

Communicable diseases. 25c.....Unit XIX

University of Minnesota, Agricultural Extension
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Pasteurizing milk at home. Extension folder 133.

FreeUnit XXI

Visual Aids (See general bibliography for addresses)

Minnesota Cancer Society, Inc.

Choose to live. 18 min. 16 mm. sound. Free.....Unit XIX

Enemy X. 19 min. 16 mm. sound. Free.....Unit XIX

Marie Curie. filmstrip. 35 mm. silent. Free.....Unit XIX

Minnesota Department of Health

Request list of available free films on preventable
diseases and sanitation.

Minnesota Public Health Assn.

Contacts. 20 min. 16 mm. sound. Free.....Unit XIX

Exploring with X-rays. 40 min. 16 mm. sound.

FreeUnit XIX

Filmstrips. 35 mm. silent. Free.....Unit XIX

Edward Jenner and the story of smallpox vac-
cination

Florence Nightingale

Edward L. Trudeau

Life of Louis Pasteur

Madam Curie and the story of radium

Robert Koch

Walter Reed

Goodbye, Mr. Germ. 14 mm. 16 mm. sound.

FreeUnit XIX

Let my people live. 15 min. 16 mm. sound.

FreeUnit XIX

On the firing line. 20 min. 16 mm. sound. Free..Unit XIX

Sand in the gears. 18 min. 16 mm. sound. Free..Unit XIX

Story of my life by tee bee. 20 min. 16 mm.

silent. Free.....Unit XIX

University of Minnesota, Bureau of Audio-Visual In-
struction

Bacteria. ¾ reel. 16 mm. silent. 60c.....Unit XIX

Cancer, its cure and prevention. 7 min. 16 mm.

sound. 75c.....Unit XIX

Defending the city's health. 1 reel. 16 mm. sound. \$1.....	Unit XVII
Good foods—milk. ¼ reel. 16 mm. silent. 25c....	Unit XXI
Health for defense. 1 reel. 16 mm. sound. \$1....	Unit XVIII
Milk and health. 1 reel. 16 mm. sound. 75c.....	Unit XXI
The housefly. 1 reel. 16 mm. silent. 75c.....	Unit XXII
Tuberculosis, how to avoid it. 1 reel. 16 mm. silent. 75c.....	Unit XIX

University of Wisconsin, Bureau of Visual Instruction

City water supply. 19 min. 16 mm. sound. \$1.25..	Unit XX
Defense against invasion (vaccination). 11 min. 16 mm. sound. color. 50c.....	Unit XIX
I never catch a cold. 11 min. 16 mm. sound. color. \$1.50. Black and white. \$1.25.....	Unit XIX
Joan avoids a cold. 9 min. 16 mm. sound. color. \$1.50. Black and white. \$1.25.....	Unit XIX
One against the world. 11 min. 16 mm. sound. \$1.25	Unit XIX
Purifying water. 16 min. 16 mm. silent. 75c.....	Unit XX
Romance of radium. 11 min. 16 mm. sound. \$1.25	Unit XIX
Sewage disposal. 15 min. 16 mm. silent. 75c.....	Unit XXII
Story of Dr. Jenner. 10 min. 16 mm. sound. \$1.25	Unit XIX
Winged scourge (malaria). 10 min. 16 mm. sound. 50c.....	Unit XIX

UNIT XVIII

WHO IS RESPONSIBLE FOR SAFEGUARDING THE HUMAN BODY AGAINST DISEASE?

Suggested Time: Four Class Periods

OBJECTIVES

- To understand that it is necessary to share cooperatively the responsibilities of disease control.
- To develop an appreciation of the practice of good health principles of living as a protection against disease.
- To appreciate the fact that the community is made up of individuals and the welfare of the community is dependent on the welfare of each individual.

SUGGESTED ACTIVITIES

Recognize the Problem

Discuss the health habits that must be developed and observed to insure optimum health of our population.

Develop the Problem

- Explain the provisions that are observed in building modern-day schools to insure the pupil's personal health.
- Develop a list of guides for healthful living.
- Explain how the community has provided for the best possible control in safeguarding its individuals.
- Invite a member of the local health department to talk on the: "Community Aspects of Disease."
- Construct a list of environmental conditions in the home that directly affect the total health of its members.
- Obtain a copy of the constitution and by-laws of the county medical association and the county dental association. Discuss their objectives both from the immediate and long-term planning for health promotion.

Evaluation

- Construct a list of factors that should be included in any project for health promotion.
- Arrange for individuals or committees to attend a meeting of the local health council; local safety council; report on their objectives for immediate and long-term health promotion.

TERMS AND CONCEPTS

Community, control of communicable diseases, diagnosis, health, healthful school living, the home, physical limitations, susceptibility, vital statistics.

SUGGESTED CONTENT

- A. What is good health and what is the individual's role in safeguarding the human body against disease?
 1. Good health is that condition in which all the organs of the body are working efficiently to enable the individual to live effectively and happily. Good health is more than the absence of disease; however, a diseased body cannot function effectively.
 2. Each individual must accept specific responsibilities in relation to personal, home, school, and community health.
 - a. Personal cleanliness should become a habit. This aids in preventing the entrance of disease organisms into the body.
 - b. Physical fitness should be improved and maintained. The practice of proper health rules in regard to nutrition, exercise, rest and sleep, and recreation aids in building resistance against disease.
 - c. Immunization against certain diseases and tests to determine susceptibility to certain diseases should be a part of everyone's plans. This serves as a protection for the individual and aids the community in the control of communicable diseases.
 - d. Medical service should be obtained in all cases of illness so that diagnosis may be made and proper treatment prescribed. Serious aftereffects of disease are often prevented by promptly consulting a physician at the onset of disease.
 - e. Periodic medical and dental examinations are necessary so that the individual will be aware of his physical condition and limitations. Diseases of the body and dental defects are more easily remedied if discovered and treated in their early stages. Advice given by the professional person consulted should be carefully followed.
 - f. Sanitary conditions of the home, school and community can be improved and maintained only through the cooperation of every individual. This is a necessary factor in controlling disease.
 - g. Sufficient knowledge of the childhood and adult diseases should be acquired so that symptoms may be recognized, the services of a physician secured, and steps taken for the protection of other members of the home, school and community.

B. What are the responsibilities of the home in safeguarding the individual against disease?

1. The home is the smallest unit of society wherein people learn to live together. Preschool training takes place almost entirely in the home, and all individuals are influenced by conditions as they exist at home. The home has definite responsibilities to its members, the school and community, as follows:

- To provide a healthful home environment. Some factors involved in a healthful home environment are:

- (1) Personal cleanliness—Habits of personal cleanliness are learned in the home and at school and should be practiced at home. The health of all members of the home may be jeopardized by the unclean habits of one member.

- (2) Attitudes of individual members—Good mental health is apparent in the home when mutual feelings of respect are evident; when problems are shared, talked over and solved; and when hobbies and recreational activities are participated in collectively and individually.

- (3) Physical factors—This includes cleanliness of the home, proper lighting facilities, proper heating and ventilating systems, equipment that is conducive to sleep and rest, and modern means for the disposal of garbage and sewage.

- b. To make proper provision for the care of minor and major cases of illness. The necessity of hospitalization will be determined by the physician.

- c. To observe and practice proper health habits in the home relative to the transmission of disease.

- d. To cooperate with school and governmental authorities in modern methods of disease detection, analysis, control and prevention.

2. Parents have the primary responsibility for the health of their children.

C. What is the school's responsibility in safeguarding the individual against disease?

1. The school has definite responsibilities to the pupils and to the community:

- a. To provide for healthful school living. This requires attention to standards for construction of the building, facilities, and sanitation, healthy school personnel and, where needed, a school lunch program.

- b. To provide health and safety instruction. This applies to the functioning of the body organs, improvement and maintenance of health, causes and methods of preventing disease, the organization of a community health program, and safety education.
 - c. To provide services for health protection and improvement. Included here are first aid for emergencies and the prevention and control of communicable diseases.
 - d. To make provisions for physical education and play with appropriate protective measures and devices.
 - e. To provide for the education and care of the physically or mentally handicapped.
 - f. To provide healthy and properly trained teachers with up-to-date information about health and the principles of healthful living.
- D. What are the community responsibilities in safeguarding the individual against disease? (Unit XVII)
- 1. The community is a group of people living in the same locality, under the same laws.
 - a. To provide and supervise a sanitary water supply and a sanitary system of disposal of garbage and sewage.
 - b. To provide for control and destruction of disease-carrying insects and animals and diseases caused by plants.
 - c. To provide local agencies (official, public and other) which function to control disease. Long-term planning for health promotion in the community can be accomplished by means of a functioning community health council.
 - d. To provide and enforce local ordinances for the protection of the milk supply to aid in preventing the spread of disease.
 - e. To regulate quarantines and isolation of individuals suffering from certain diseases.
 - f. To supervise hotels, restaurants and housing as to sanitary conditions.
 - g. To collect vital statistics so that the prevalence of certain diseases may be ascertained and necessary precautions taken for prevention and control of the diseases.

UNIT XIX

WHAT PROGRESS HAS BEEN MADE BY CIVILIZED SOCIETY IN CONTROLLING DISEASE?

Suggested Time: Twelve Class Periods

OBJECTIVES

- To develop an appreciation of the progress that has been made in medicine and surgery for the protection of the individual.
- To acquire a knowledge of some of the preventable diseases and their control.
- To gain an understanding of the dangers involved in self-medication.
- To appreciate periodic health examinations as a means of detecting some diseases in their early stages.

SUGGESTED ACTIVITIES

Recognize the Problem

- Discuss: What does sickness mean to industry and labor in terms of time and economic loss?
- Investigate the school absence record and analyze the amount of time lost because of sickness.

Develop the Problem

- Arrange for a talk by a physician on some facts concerning the diseases that are the leading causes of death.
- Prepare an auditorium program giving facts concerning the leading causes of death. Stress prevention and control of diseases.
- Prepare bulletin board displays on prevention and control of various common diseases.
- Prepare reports on "health heroes," men and women who have made outstanding contributions in the field of health.
- Ascertain the effect of poverty, occupation and race on the incidence of tuberculosis.
- Discuss disease germs in general, what conditions favor their growth and how these conditions are found in the human body.
- Discuss the value of periodic medical examinations. (Unit II)
- Prepare a report on recent developments in anesthesia.

Evaluation

- Prepare a list of factors that contribute to healthful school living. Compare conditions in school with the prepared list. Encourage any needed improvements.

Get statistics on deaths from tuberculosis, cancer and heart disease for the years, 1920, 1930 and 1940. Evaluate.

Discuss: What is my responsibility to the community in regard to the spreading of disease?

Prepare a list of factors that aid in the prevention of disease in the individual. Prepare a list of factors that aid in the control of disease.

TERMS AND CONCEPTS

Active immunity, anesthesia, antiseptic, asepsis, contagious, Dick test, disinfection, germ theory of disease, germicide, immunization, inoculation, isolation, microscope, passive immunity, patient medicine, quarantine, radium, sanatorium, Schick test, transmit, tuberculin test, vaccination, virus, X-ray.

SUGGESTED CONTENT

A. What are some outstanding contributions which aid in preventing, combatting and controlling disease?

1. Microscope—The turning point in man's effort to conquer disease came with the discovery of the microscope in the seventeenth century by Anton Leewenhoeck. This made it possible to observe the action of tiny organisms that were not visible to the naked eye. Today the microscope is used in the diagnosis of disease and the study of the structure of cells for the advancement of medical science.
2. Germ theory of disease—A French scientist, Louis Pasteur, in the nineteenth century, discovered that tiny organisms were the cause of disease, and that the type of germ present in a sick person was the same type present in another individual who had the same disease. In other words, a disease could be determined by the type of germ present in an individual. This was one of the most important advancements in the conquest of disease.
3. Immunization—
 - a. Active immunity—Inoculation is the introduction of the virus of a disease, attenuated bacteria, or their toxins into the body so as to cause the body to produce substances to counteract these products and thus secure a future immunity. The resistance thus developed is called "active immunity" because the body produces its own protective substances. Vaccination against smallpox is an excellent example of a method used to produce active immunity.
 - b. Passive immunity—When the protective substances which have been produced by a person who has had the disease or by an animal into which the bacteria or their toxins

have been injected are used for injection into a person it provides protection known as "passive immunity." This protection is given when there is immediate need; for example, when a person is actually ill with a disease or has been exposed to a disease against which such protective substances are available. Diphtheria and tetanus are examples of diseases for which serums containing protective substances (antitoxins) may be used for treatment.

4. Progress of medicine and surgery—

a. Development of germicides and antiseptics

- (1) Germicides are germ killers. The use of carbolic acid as a germicide was discovered by Lord Lister after observing the prevalence of infections after operations. Lord Lister developed antiseptic surgery or the technique of using carbolic acid to sterilize operating instruments, to spray the surrounding air to kill organisms causing infection and to dress wounds. Some of the germicides are: alcohol, bichloride of mercury and tincture of iodine.
- (2) Antiseptics are chemicals that stop or slow up the action of disease organisms. Examples of antiseptics are mercurochrome and silver nitrate.

b. Anesthesia is one of America's greatest contributions to medical science. Before the discovery of anesthesia, surgeons had to work rapidly to spare their patients as much discomfort and pain as possible. Ether was the first anesthetic used to induce loss of consciousness. Surgeons were now able to be more deliberate in their operations. As a result more was learned about the body, and more difficult and complex operations were possible. Chloroform and nitrous oxide were later used as anesthetics. Other developments in anesthesia are:

- (1) Use of inhalants to induce general anesthesia and mechanisms to control the anesthesia. These produce unconsciousness.
- (2) Spinal anesthesia is used to anesthetize part of the body by introducing the anesthetic into the appropriate part of the spinal canal. Patient remains conscious.
- (3) Local anesthesia is a method used to anesthetize areas of the body such as a finger or tooth.

c. Asepsis has replaced Lord Lister's antiseptic method of preventing infection in wounds. Aseptic methods include the disinfection of the skin area where surgical incision is to be made and the use of sterilized instruments, dressings and sutures. Surgeons and nurses wear sterile masks, gowns, caps and gloves during an operation.

- d. X-rays were discovered by Professor Wilhelm Roentgen while working in his laboratory. Not much was known about these rays, hence the name, X-rays. Research workers later defined them as being a form of radiant energy which could penetrate apparently solid substances because of their short wave length. The ability of X-rays to pass through the skin and tissue beneath the skin to cast shadows on a photographic plate has proven to be one of the best of diagnostic aids to physicians. Bones and heavier tissues tend to block the passage of X-rays and thus cast a shadow on the X-ray film and appear dark in color. Overexposure to X-rays will cause damage to cells and tissues. Accurately controlled exposure to X-rays has proven beneficial in the treatment of some disease, such as cancer. Benefits of Roentgen X-rays in diagnosis are most striking in the fight against tuberculosis. Before X-ray the physician had to depend on sound, touch and the microscope to find tuberculosis. By the use of X-ray, tuberculosis can now be found in its early stages and treatment begun when it will do the most good.
 - e. Radium was discovered by Marie and Pierre Curie who noted the similarity of certain rays that were given off by both radium and X-rays. Consequently, radium is also used in the treatment of cancer.
- B. What are some control measures relative to school attendance based on the Minnesota health laws and regulations?

Note: Chart follows on next page.

What Are Some Control Measures Relative to School Attendance Based on the Minnesota Health Laws and Regulations? *

Disease	**Incubation Period	Isolation Period	Regulation of Other Children in the Family	Patient May Return to School	Special Precautions
CHICKEN POX	14 to 21 days	Until lesions are healed and skin is free from crusts. (P. 65)	Children from the household who have previously had chicken pox may give written permission to go to school only on health officer's sanction.	When health officer gives written permission.	Cases of reported chicken pox in persons of 16 years of age or over shall be examined by health officer for record of successful vaccination against small-pox.
DIPHTHERIA (Laryngeal Croup, Membranous Croup)	Usually 2 to 5 days	Until two consecutive sets of separate negative nose and throat cultures are obtained, taken not less than 24 hours apart.	All members of the household must be quarantined until two consecutive negative sets of separate nose and throat cultures are obtained from clinical cases and other infected individuals, and one set of negative cultures from all other members of the household. (P. 58 through 61)	After obtaining required negative cultures on written permission of the health officer.	
EPIDEMIC ENCEPHALITIS (P. 58) MEINGITIS (P. 58) POLIOMYELITIS (Infantile Paralysis) (P. 57)	About 7 to 10 days 2 to 10 days 5 to 14 days	At least two weeks after the first symptoms appear and until active symptoms subside.	Members of the household shall not return to school for two weeks after gives last exposure. Continued dwelling within the quarantined household constitutes exposure.	When health officer gives written permission.	
MEASLES Reg. 900— (P. 61)	About 10 days	Ten days after the appearance of the last case in the home.	Immune persons, i.e., those who have had measles, living in a home in which measles exists, may be permitted to return to school only on written permit from the health officer.	When health officer gives written permission.	
GERMAN MEASLES	"Importance of fever and from true measles," and "Details of control to be determined by Local Health Officer."	Never less than three weeks after the first appearance of the last case in the house and until health officer finds nose, throat, glands and ears normal.	All children remaining in the home are under strict quarantine and shall not return to school only after health officer's inspection and permit not less than one week after raising household quarantine. (See Reg. 1202, P. 62)	Only on written permission of the health officer.	No provision for a well child to attend school while remaining in a home quarantined for scarlet fever. At health officer's discretion or investigation, a well person may be removed from the home where there are no children, kept under observation 7 to 10 days and permitted to return to school while residing outside the infected home.
SCARLET FEVER (Pp. 61, 62)	2 to 7 days; usually 3 to 4 days				

Disease	Incubation Period	Isolation Period	Regulation of Other Children in the Family	Patient May Return to School	Special Precautions
SMALLPOX (P. 63)	9 to 17 days; rarely a shorter or longer period.	Until patient is free from scabs and dark colored plaques.	Persons within the infected home who cannot show evidence of recent successful vaccination or recent attack of smallpox must be vaccinated within three days of first exposure or be quarantined 21 days. In the presence of an outbreak of smallpox the health officer may exclude from school all children who have not recently had a successful vaccination.	When health officer gives written permission.	
TUBERCULOSIS	Widely variable.	While tuberculosis bacilli are found in sputum.	Well children may attend school after thorough examination.	Upon written permission from the health officer.	Cases living at home should be isolated from the family. Medical examination, including tuberculin tests and x-ray films should be carried out on other members of family and close contacts.
TYPHOID FEVER	From 1 to 4 or 5 weeks; rarely shorter or longer; usually from 10 to 21 days.	Until recovery takes place.	Upon receiving the approval of the health officer, other members of the family are not restricted.	When health officer gives written permission.	A person recovered from typhoid fever is forbidden to handle ready-to-eat food sold or served to the public until the State Board of Health advises the local health officer that required examinations indicate that infection no longer exists. Such persons should always wash their hands thoroughly after going to toilet and before handling food. Children from homes where typhoid exists must not be allowed to give to others any food from their own homes.
WHOOPING COUGH	7 to 14 days.	Until at least two weeks after development of the paroxysmal stage or whoop in the last case.	Children in the home who have had whooping cough may return to school gives written permission on written permit from the health officer.	When health officer gives written permission.	
MUMPS	2 to 3 weeks; usually about 18 days.		"Mumps is generally considered an unimportant disease except when it attacks persons at the ages of puberty or above." "Details of control measures and school attendance to be determined by health officer."		
SKIN CONDITIONS Scabies, Impetigo, Ringworm and Pediculosis			Exclude from school Non-infected children may attend when health officer gives written permission.		

*Minnesota Department of Health—The Teacher's Part in the School and Community Health Program. P. 12-13.
 ***The Control of Communicable Diseases," a report of a committee of the American Public Health Association. 6th Edition, 1945.
 Numbers in parentheses () refer to pages in the Minnesota Health Laws and Regulations, July 1, 1944.

C. What are some of the diseases to guard against in childhood and youth?

1. Many diseases are preventable. Those that are classified as noncommunicable are also preventable to some extent because it is believed that they may have their origin in some disease that was suffered by the individual in earlier life.
 - a. Chickenpox—Everyone is so susceptible to chickenpox that nine out of ten children have had the disease by the time they are fifteen years old. The cause of chickenpox is believed to be a virus which is transmitted through secretions of the upper air passages and by means of crusts which form on skin sores. The secretions from the sick person and all articles they have used should be thoroughly disinfected. One attack of this disease usually makes the individual immune from further attacks. There are practically no deaths from this disease.
 - b. Diphtheria—Children not immunized are almost defenseless against diphtheria. Diphtheria is a dangerous contagious disease caused by the growth of diphtheria germs in the nose and throat which produce powerful poisons (toxins) that affect the nerves and heart. Diphtheria is spread from person infected with diphtheria germs by any means which will carry the germs in their nose and throat discharges to the nose and throat of an unprotected person. All persons should be immunized against diphtheria. The prevention of diphtheria is largely the responsibility of the family, therefore, cooperation is necessary with school and community immunization programs. In 1910 there were 566 deaths from diphtheria in Minnesota. Due to an active immunization program in this state, the year 1939, showed only eleven deaths from this disease. There were twenty-two deaths from this disease in 1945. The susceptibility to diphtheria may be determined by the Schick test.
 - c. Infantile paralysis (poliomyelitis) — This disease when it invades the nervous system (fifteen per cent of the cases) causes inflammation of the gray matter of the spinal cord, destroying or injuring many of the motor cells located there. Consequently, the muscle fibers which were supplied with motor impulses from these cells are no longer able to contract and are said to be paralyzed. In many cases of infantile paralysis only a few of the motor cells are destroyed so that resulting muscular weakness is only slight. In most cases, some of the motor cells are only temporarily injured so that muscular strength is largely restored. In a small proportion of all cases very extensive and permanent paralysis with atrophy of the affected muscles takes place, and in a few cases, death occurs. In cases where the

muscles of respiration become paralyzed, life is often saved by use of the "iron lung." Infantile paralysis is caused by a virus which is present in the nose and throat secretions of sick persons and carriers, and is believed to enter the body through the mucous membranes of the nose. Factors leading to the spread of infantile paralysis are not well known. It may be from the body excretions of infected persons or carriers, contaminated food, milk or sewage; or flies carrying the virus. There are no specific preventives or cures known for infantile paralysis, but after the acute stage of the disease is over, skillful care, massage and special exercise will often aid in restoring the usefulness of paralyzed muscles. Elizabeth Kenny, an Australian nurse, has become well known by her method of treatment of infantile paralysis to reduce the crippling effects. "Sister" Kenny has trained many technicians at the Kenny Institute in Minneapolis. The funds to carry on this work were granted by the National Foundation for Infantile Paralysis.

- d. Measles—Measles is the most contagious common childhood disease. It is so "catching" that most people have it sometime during their life. Epidemics occur every three to four years in Minnesota usually during the winter. Measles is spread by the exposure of well people to those who have the disease. It is believed that measles is caused by a virus. All people must cooperate with the instructions of physicians and health officers to control the spread of measles. A special serum is available for use in preventing or modifying measles in young children who have been exposed.
- e. Scarlet fever—This is a serious contagious disease characterized by a scarlet rash from which it gets its name. Scarlet fever is caused by bacteria which produce a strong poison (toxin) which makes the individual very ill. The chief danger lies in the complications which follow. The principal complications are sinus, ear and mastoid infections due to the extension of the infection from the pharynx to these regions. Scarlet fever is spread by nose, mouth and ear discharges of infected persons or carriers, personal contact with an infected person or things he has handled, or infected milk. The control of this disease depends on early recognition of the disease, isolation of all cases, quarantine, disinfection of discharges of infected person, disinfection of articles handled by infected person, cleaning the sick room after it is vacated, and pasteurization of milk. The death rate from scarlet fever in Minnesota has declined from 284 deaths in 1910 to eleven deaths in 1945.
- f. Smallpox—This was the most common and most dreaded disease in the world before vaccination was discovered by

Edward Jenner. Ninety-five per cent of the people had smallpox at one time or another and twenty-five per cent of those who contracted it died. Those who recovered from it were usually disfigured for life. Today, because of vaccination, most people have never seen a case of smallpox. States with compulsory vaccination laws have practically no smallpox. Minnesota has no compulsory vaccination law and has had cases of smallpox in increasing numbers in recent years. The only method of smallpox eradication is vaccination. Every child should be vaccinated before he is one year old and revaccinated before entering school. The entire population should be vaccinated whenever the disease appears in a severe form. Unless one has had smallpox, the first vaccination will leave a characteristic scar. The success of the second vaccination is indicated by a definite immune reaction which rarely leaves a scar. From 1913 to 1945 Minnesota had 44,479 reported cases of smallpox, of which ninety-three per cent had never been successfully vaccinated.

- g. Tuberculosis—Forty years ago tuberculosis was the chief single cause of death while now it is number seven on the list in the United States. Tuberculosis ranks ninth as the leading cause of death in Minnesota. There are two principal forms of tuberculosis: lung (pulmonary) tuberculosis which is due to a type of bacteria that attacks only human beings; tuberculosis of the bones, glands, skin and other tissue which may be due to the human being type of bacteria, but is usually due to the type of bacteria which causes tuberculosis in cattle (bovine type). The human type of tuberculosis is carried from person to person chiefly by means of infected sputum or things soiled with it, while the bovine type is carried from cows to human beings through unpasteurized milk. Tuberculosis is not inherited. The disease is usually contracted from people who have active cases of the disease. Tuberculosis is caused by tubercle bacilli. This organism was first identified by Robert Koch.

When tuberculosis germs first enter the lungs of a healthy person they may do comparatively little harm. Certain cells of the lungs build themselves around the germs, and imprison them, thereby protecting the lungs from damage. This is the childhood type of tuberculosis. The germs usually die but may remain in a dormant state awaiting a chance to get out of their enclosure. Repeated frequent exposure to tuberculosis germs will often cause tuberculosis of the lungs of the serious adult type. Keeping the general health of your body at its best and isolating persons who are liberating the tuberculosis germs are the best

preventives. There are no known methods of immunizing against tuberculosis or drugs to cure tuberculosis. For the majority of persons afflicted with tuberculosis, treatment in a sanatorium where all the facilities and experienced care are at hand is the best. Edward Trudeau established the first tuberculosis sanatorium in the United States.

Tuberculosis can be arrested, and the earlier the disease is discovered, the quicker is the recovery. The tuberculin or Mantoux test devised by Mantoux and Von Pirquet is used to determine whether tuberculosis germs are present in the body. This test is made by injecting tuberculin between the layers of skin or by putting a piece of adhesive tape, on which there is dried tuberculin, on the skin. A positive reaction, as determined by the physician, indicates a need for further examination. This means, first of all, an X-ray of the chest, an appraisal of the X-ray findings, and a physical examination by a physician. If an early active case is found, immediate treatment will cure the condition more quickly and easily than if it had reached a more advanced stage. This will benefit every individual in the community, because any case of tuberculosis which is found and treated will remove a possible source of infection from the community as a whole. Everyone should have a personal interest in, and a sense of responsibility for, the control of tuberculosis in the community.

- h. Typhoid fever—The number of people attacked and killed by this disease has been drastically reduced in the past twenty-five years. The greatest progress in the control of typhoid fever has been made in the larger cities due to the organization of health offices with sanitary control of water and milk supplies. The smaller communities have lagged behind in making improvements along this line.

Typhoid fever is caused by rod-shaped bacteria. A highly protective vaccine is made from artificially cultivated groups of these bacteria.

The source of infection is from the body wastes of a person who is sick with typhoid fever or a carrier of typhoid fever bacteria. There are four principal ways in which the bacteria get from an infected person to healthy people and thus infect them: (1) by food which has been contaminated with germs on the hands of a carrier or a sick person; (2) through drinking water which has become contaminated; (3) through drinking milk which has become contaminated by carriers employed in the dairy or using contaminated water to rinse utensils; and (4) by flies which alternate their visits to the privy and the kitchen and carry the bacteria on their legs and body.

Typhoid fever is controlled by correction of the source of infection, isolation of the infected person and disinfection of the body wastes. Carriers of typhoid bacilli are restricted from working in food establishments and dairies.

Vaccination against typhoid fever is principally used when large organized bodies of men, such as soldiers, must live for a considerable time under insanitary conditions, and for people in areas where sanitary arrangements have been disorganized by earthquake, flood or fires. There is no specific cure for typhoid fever.

- i. Whooping cough—This disease is a frequent cause of death especially among very young children. It is caused by bacteria that are found in material expectorated by an infected person; consequently, the sputum and articles soiled by it should be thoroughly disinfected. Vaccines have been developed which are useful in developing immunity to whooping cough. Everyone should comply with the restrictions set up by the local health officer to aid in controlling the spread of this disease.
- j. Mumps—This disease is an inflammation of the salivary glands located just below the ears. The death rate is very low, but this disease has a tendency to occur in epidemics which may disable a large group of people for several weeks. Early recognition, isolation of the individual cases, and disinfection of nasal and mouth discharges of the infected person may help prevent the spread of the disease. One attack usually gives lifelong immunity. Suspected cases should be isolated and directions of the health officer closely followed.
- k. Common cold — This is an acute infection of the mucous membranes of the upper respiratory tract. The common cold may be accompanied by serious complications. Lost school time for pupils because of colds averages two days per year. There is little natural immunity developed against colds. The common cold is caused by a virus, which is present in the nose and throat secretions of a person ill with a cold and is transmitted from person to person through coughing, sneezing, talking, and use of articles handled by the infected person. All people should make a habit of shielding the mouth and nose with a handkerchief when sneezing or coughing to prevent the spread of colds and other diseases. In addition, an individual should avoid putting his fingers in the mouth and realize the necessity of washing hands before eating. It is very important to seek the advice of a physician during what one may think is an ordinary cold, as some serious diseases like whooping cough, scarlet fever, and diphtheria, have their begin-

ning in what appears to be a common cold. There are many so-called cures and preventions for colds advertised. There is no evidence that any of them will prevent colds or hasten a cure. Most of the patent medicines are a waste of money. The best procedure in caring for a severe cold is to go to bed and call a physician.

1. Pneumonia—The word “pneumonia” means inflammation of the lungs. Toxins produced by the germs causing pneumonia are absorbed by the body. These may poison other vital organs of the body and possibly produce death. Pneumonia is caused by round-shaped bacteria. The pneumonias are usually preceded by temporary lowering of body resistance which may be caused by marked fatigue, excessive liquor consumption, chilling, colds or some other disease. The sulfonamides and penicillin are used successfully in the treatment of the pneumonias. General measures for the control of the spread of pneumonia are the same as for other respiratory diseases. For the prevention of the pneumonias one should avoid anything which tends to reduce vitality.
11. Tetanus — This is usually a puncture wound infection caused by the tetanus bacilli getting into the wound with bits of clothing or dirt. Tetanus bacilli are rod-shaped bacteria which produce toxin that injures the nerves of the muscles controlling the movements of the jaws and other parts of the body. The bacteria causing tetanus can be found in the soil almost anywhere in nature, particularly in manured fields and barnyards. Gunshot wounds and gunpowder burns are very conducive to tetanus. The best preventive measure is to be immunized against tetanus during childhood by two or more injections of tetanus toxoid. This is frequently given at the same time as immunization against diphtheria. After a severe wound from cuts, abrasions, lacerations or punctures of the skin or tissues, additional tetanus antitoxin can be given. Tetanus is rarely transmitted from one person to another.
- n. Rocky Mountain spotted fever—This disease gets its name from the area in which it was first discovered. Now it has spread over a large area. It is conveyed to humans entirely through the bite of ticks. Ticks are bug-like animals which are “blood suckers.” They are infested with the microorganism causing this disease by sucking the blood of infected animals. The microorganism in turn is passed on to humans when bitten by the tick. Preventive measure necessitates the frequent inspection of the body for the presence of ticks and their prompt removal, without crushing. The hands should be protected when removing ticks from animals.

- o. Anthrax—This disease is confined mostly to the individuals who work with animals or products of animals. The bacteria causing the disease gain entrance to the body through cuts, inhaling and through the alimentary tract; may be carried by flies. This disease is rare and sporadic and occurs in man only when it occurs in the animals he handles. The spread of the disease is controlled by the isolation of the individual concerned and disinfection of all articles handled by the infected person. Infected animals should be killed and incinerated.
- p. Malaria—At one time it was believed that malaria meaning "bad air," was caused by gaseous pollution of the air around swamps and marshes. The cause of malaria is a one-celled animal which is transmitted to man by a certain species of mosquito (anopheles). The organism lives part of its life cycle in the salivary glands of the female anopheline mosquito and is transferred to man when bitten by the mosquito. When the parasite enters man's blood stream it attacks the red corpuscles and produces alternating chills and fever. Control of malaria depends on measures taken to eradicate the mosquito from swamps and other breeding places, screening of houses and use of poisons to kill the larvae of the mosquito. Malarial attacks can be cured with quinine and atabrine. It is possible that malaria may spread over greater areas due to infected persons returning from malaria areas. Some southern states have a very serious toll of death and economic loss.
- q. Rheumatic fever—This is an infectious disease of the body as a whole but has a tendency to affect the joints and may cause incapacitating heart disease. Rheumatic fever occurs only in humans with the first attacks common among children five to ten years of age. Individuals may suffer only one severe attack or there may be recurrent attacks of this disease. Rheumatic fever is most frequent in cooler climates, more frequent in white people than in negroes, and slightly more frequent in females than in males. There seems to be a direct relationship between the occurrence of rheumatic fever and malnutrition and poor living conditions. This disease is thought to be caused by a type of bacteria (streptococci) that infect the upper respiratory tract. The first attack of rheumatic fever is usually preceded by scarlet fever, tonsillitis or some other respiratory disease.

Rheumatic fever is not communicable from person to person. Factors which aid in controlling rheumatic fever are adequate care during the disease and period of recovery and attention to problems of poor housing and malnutrition. Investigations have shown that the use of the sulfon-

amides aid in preventing the spread and recurrence of rheumatic fever attacks.

- r. Rheumatism—The word rheumatism is used to cover various aches and pains. This disease is rarely fatal but causes an enormous amount of pain and various degrees of deformity of the joints. When joints are involved, it is called arthritis which may be caused by an infection at the root of a tooth, in a sinus, tonsil or at some other places in the body. Other contributing causes might include emotion and physical shock, fatigue, exposure, injury, abnormal weight, inadequate diet and hereditary predisposition to the disease. There is no known cure for rheumatism although the use of certain drugs or applications of heat gives some measure of relief.
- s. Dietary deficiency disease (Unit IX)
 - (1) Xerophthalmia—A disease of the eyes characterized by extreme dryness of the conjunctiva. Individuals may develop night blindness and very dry skin. This condition is not contagious.
 - (2) Pellagra—A noncontagious vitamin deficiency disease affecting the skin, alimentary tract and nervous system. Lack of nicotinic acid in the diet is conducive to this condition. Pellagra occurs in every country. There are approximately 400,000 cases annually in this country, a greater portion of which is found in southern United States. Nicotinic acid can now be synthesized and the diet may be supplemented with this preparation. The diet should be supplemented with synthetically prepared vitamins only on the advice of a physician.
 - (3) Beriberi—A noncontagious disease associated with the lack of vitamin B, or thiamin in the diet. It is a disease which may appear in any race suffering from starvation and poverty. Not much is known as to how the lack of thiamin causes beriberi, but this condition is known to exist. There is a direct relationship between beriberi and an unbalanced diet abundant in "highly milled" cereals. Beriberi is classed as an oriental disease characterized by a general rundown condition that may be accompanied by a painful rigidity of the body. This disease would disappear if all persons could be supplied with an adequate diet. Diets may be supplemented with synthesized thiamin on the advice of a physician.
 - (4) Scurvy—This condition results from the lack of vitamin C (ascorbic acid). The disease is characterized by

general weakness, anemia, spongy gums, and tendency toward hemorrhage of the mucous membranes. Vitamin C has been prepared synthetically and may be used to supplement the diet, if taken under a physician's care.

- (5) Rickets—A disease of infants caused by lack of vitamin D. Rickets is usually considered as a disease of the bones because of the deformities that result from a lack of this vitamin. The function of vitamin D is to enable the body to use calcium and phosphorus in building bones. The source of vitamin D is from certain foods and from sunlight. Various foods are now being exposed to ultraviolet light to increase their content of vitamin D. This is called irradiation. Irradiated milk is a convenient way of supplying vitamin D to children. During the winter months cod-liver oil, irradiated or vitamin-enriched milk and a liberal number of eggs should be included in the diet, particularly for children.
- (6) Simple anemia—Anemia is defined as a deficient quantity or quality of the blood which reduces its capacity to carry oxygen. Hemoglobin is the substance in the red corpuscles which carries oxygen to the cells. Iron is utilized by the body in the formation of hemoglobin. Simple anemia is a condition which is characterized by paleness, lack of vitality, and low hemoglobin. People having simple anemia are usually benefited by large doses of iron salts.
- (7) Simple goiter—Iodine is a chemical element which is essential to health. Its use in the body is in connection with the function of the thyroid gland. If iodine intake is insufficient the thyroid gland enlarges and a condition known as simple goiter results. The use of iodized salt usually provides ample iodine for the body's needs.
- t. Cancer—Every cancer begins as a single cell or a group of cells which starts to grow more rapidly and independently of the rest of the body tissues. As this increases in size and invades the surrounding tissue, it causes trouble either by interfering with the function of the invaded organs or by the cancer cells being carried by the blood stream and lymphatics to distant organs and starting new growth in them. Cancerous tissue frequently breaks down producing open sores, or gives off a poisonous substance into the system. If a cancer is not removed or checked in its growth it finally causes death.

Cancer is largely a disease of adult life. It is more frequent among women than among men. Among the leading causes of death in the United States and in Minnesota, cancer ranked second, exceeded only by heart disease. In Minnesota, figures released for 1945 show that 4,096 persons died of cancer which represented fifteen per cent of the total deaths of the state.

The only effective means of treatment of cancer is its complete destruction by the use of radium, X-ray or removal by surgical means.

Cancers of the stomach, the intestine and the skin are common in both sexes. Cancers of the lip and mouth are prevalent in men, while cancers of the womb and breast are prevalent in women. No tissue in the body is free from the possibility of cancer.

The early diagnosis of cancer is an important factor in the favorable outcome of this disease. Oftentimes conditions which individuals think are unimportant may be cancer in its early stages. The selection of a physician is always the most important factor in controlling cancer. One should beware of the advertised cures for cancer. The use of unscientific remedies and consultation with nonmedical persons are a waste of valuable time for the treatment of this disease. Physicians of recognized ability will diagnose and recommend the best procedures to follow.

- D. What types of service can be expected from physicians in regard to disease control?
1. The modern practice is to use medical science for disease prevention and health promotion rather than for just curing the sick.
 - a. Why do individuals fail to seek medical advice until they are compelled by ill health to do so?
 - (1) Some people view health merely as absence from disease.
 - (2) Many persons have built up a fear of all physicians, dentists, nurses and hospitals.
 - (3) Many people are ignorant of the services and efficient treatment that can be given by physicians.
 - (4) People of low economic income fear the cost of medical treatment. These people do not know that physicians' fees and hospital charges are usually based on the individual's ability to pay.

b. Why is self-treatment dangerous?

- (1) No one can safely care for any human ailment without a thorough knowledge of the structure and functions of the body.
- (2) There are no so-called patent medicines that are "cure-alls" for diseases.
- (3) Self-treatment is dangerous as it delays adequate treatment.
- (4) Patent medicines are sometimes harmless products, but may be worthless, expensive and dangerous.

UNIT XX

WHY IS IT NECESSARY TO PROVIDE AND MAINTAIN A PURE WATER SUPPLY?

Suggested Time: Four Class Periods

OBJECTIVES

- To gain an understanding of the characteristics of safe water.
- To acquire a knowledge of some methods by which water becomes contaminated and the diseases caused by it.
- To acquire a knowledge of some methods by which water is made safe for domestic use.

SUGGESTED ACTIVITIES

Recognize the Problem

Secure a sample of swamp water, place a drop on a glass slide, place under microscope and observe. List the things that are seen. (Repeat procedure several times so that variety of contents may be observed.)

Discuss situations that may be conducive to contaminated water on farms, suburban areas, and cities especially in relation to location, construction and operation of water supplies.

Develop the Problem

Visit the local water plant. Inquire as to the source of water, method of purification, and number of gallons used per day (divide this number by the population of the community to arrive at the average amount used per person).

List a number of actual factors that may cause water to be contaminated.

Demonstrate the process of sedimentation by using a large jar in which soil is mixed with water. Allow to stand for one hour. Observe the results.

Demonstrate filtration. Materials: Beaker, large glass funnel, coarse gravel, medium gravel, fine gravel, filter paper and solution of soil in water. Place the filter paper in funnel, next a layer of fine gravel, then a layer of medium gravel, and then a layer of coarse gravel. Pour soil solution into funnel slowly. Use beaker to collect filtered water as it comes through the funnel. Observe the results of filtration.

Demonstrate the action of chemicals in the treatment of water. Place glass slide, on which is a drop of water containing one-celled animals, under the low power of the microscope. Observe the action of the one-celled animals. Continue to observe while another student places a small drop of iodine on the specimen. Observe the results.

Evaluation

Make a survey of the water supply at home. Are there any possibilities that the water supply might become contaminated? If so, take steps to correct any deficiency.

Prepare a written report on the adequacy of your local water supply in relation to healthful living.

TERMS AND CONCEPTS

Adequate supply, chlorination, cistern, clear water, contamination, dissolved minerals, drainage, evaporation, filtration, ground water, natural filtration, pleasant to taste, poisonous salts, pollute, reservoirs, run-off, sedimentation, site, surface water, water cycle.

SUGGESTED CONTENT**A. What is the source of the water supply?**

1. Water is used in tremendous quantities for a variety of things. To be satisfactory for drinking, cooking and other domestic uses water should have the following characteristics:
 - a. Incapable of causing discomfort or disease.
 - b. Clear, and practically free of color and odor. This does not necessarily mean that the water is safe.
 - c. Pleasant to the taste.
 - d. Free from poisonous salts or an excessive amount of dissolved minerals.
2. Water supplies largely originate from and are replenished by rainfall.
 - a. In falling through the air, rain absorbs carbon dioxide, nitrogen and other gases from the atmosphere.
 - b. As rain nears the ground, its quality is affected by the presence of dust, smoke and bacteria that are in the air.
 - c. When rain reaches the ground, it is contaminated by bacteria on the surface of the earth.
 - d. Some of the rain flows on the surface of the earth as "run-off" to form streams and lakes, some of it is used by plants, some evaporates and some soaks into the ground to become the ground water supply.
 - (1) "Run-off" water is always contaminated and is not safe to use, unless filtered and chemically treated. Boiling water for ten minutes will make it usable.
 - (2) As that part which becomes ground water filters through the earth formations, the number of bacteria which it carries are reduced (natural filtration), but

the water takes with it, in solution, some of the mineral substances of the ground. Dissolved minerals tend to make water hard, give it taste or odor and sometimes produce color. As ground water is brought to the surface, some of the minerals leave (precipitation) the water when it comes in contact with the oxygen in the air and forms hard crusts in water pipes and boilers.

- e. The process of rainfall (condensation) and evaporation is known as the water cycle.
- B. What factors must be considered in locating a source of community water supply?
1. An adequate, suitable and safe supply of water is essential for the physical comfort and health of every individual.
 - a. The number of people in the locality to be serviced must be considered to determine the adequacy of the water supply.
 - b. The site for the source should be adequately drained and should not be subject to flooding waters.
 - c. The site should be a reasonable distance from areas of underground construction, such as tunnels and sewers which may serve as a source of contamination.
 - d. The locality should have suitable earth formations which are conducive to good natural filtration and drainage.
 - e. The site should not be near areas of possible contamination such as industrial developments having poisonous or offensive liquid wastes, swamps, gasoline stations, sewage disposal plants, privies and barns. Water that has been made unclean or otherwise unfit for a given use by sewage, industrial wastes or other harmful substances is said to be polluted.
- C. How do cities maintain a water supply, and how is the water purified?
1. Safe water is sometimes not in close proximity to some cities, therefore, their water must be transported many miles (by aqueduct), or the closest available water purified for use.
 - a. The methods used in the process of purifying water are:
 - (1) Sedimentation—Water is run into a reservoir and allowed to stand. The heavier solid particles that are present settle to the bottom.
 - (2) Filtration — Water from sedimentation tanks is run through a series of filters which remove bacteria and finer solid particles.

- (3) Chlorination—Chlorine is added in a definite proportion to water and kills the remaining harmful organisms.

D. How do rural families obtain their water?

1. There are various kinds of supplies from which drinking water may be obtained:

- a. Ground water supplies

- (1) The necessity of a dug, bored, drilled or driven well depends on the nature of rock formations encountered and the depth necessary to reach a supply of water. Well water is usually free from disease-producing bacteria and if properly located, constructed and operated will remain safe for use.
- (2) Springs are natural basins in the surface formations from which water overflows into some natural water course. Because springs are unprotected at the surface they are subject to contamination at any time unless properly safeguarded.

- b. Surface water supplies

- (1) Cisterns are reservoirs for the storage of surface water or rain water collected from the roofs of buildings. Cistern water is not considered safe for drinking unless treated, because it is impossible to keep contaminated material from being carried into it. Cistern water is usually used as a supply of soft water for kitchen and laundry purposes.
- (2) Lakes, ponds, and streams are always contaminated and should not be used unless filtered and chemically treated or boiled for at least ten minutes.

E. What are some ways in which an unprotected water supply may become contaminated by disease-producing bacteria?

1. In order to insure a safe supply of water it is necessary that every precaution be taken. Some ways in which water can become contaminated are:

- a. Contamination of the well, pump, casing, or piping with infected material during construction or while being repaired.
- b. Contamination of the water by material carried through an open slot in the top of the pump, or by infected water used for priming.
- c. Contamination of the water by flooding with surface water.
- d. Contamination by leakage of sewage or polluted surface water through the well casings.
- e. Contamination of safe water by having faulty plumbing which gives unsafe water access to safe water supply.
- f. Contamination after water is drawn by contact with fingers, hands, or unclean utensils.

2. The diseases most likely to be conveyed by water in Minnesota are typhoid fever, paratyphoid fever, diarrhea, and dysentery.

UNIT XXI

WHY IS IT NECESSARY TO PROTECT THE MILK SUPPLY?

Suggested Time: Four Class Periods

OBJECTIVES

To gain an understanding of the necessity of protecting the milk supply.
To acquire an appreciation of the necessity of practicing sanitary methods of handling milk, as an example of general food sanitation.

SUGGESTED ACTIVITIES

Recognize the Problem

Discuss some of the diseases to which cattle are subject and which may affect man.

Develop a list of diseases that are milk-borne.

Determine how the milk supply for the school lunch program is safeguarded.

Develop the Problem

Visit the local pasteurization plant. Observe the process of pasteurization. Interview the operator as to the sanitary methods practiced.

Demonstrate the heat-treatment of milk. Illustrate how the milk may be recontaminated.

Invite the local veterinarian to talk on the prevalence of diseases among cattle that may affect man. What steps have been taken to eliminate these diseases? Show how a bacterial count of milk is made.

Evaluation

Develop a check list for the protection of milk at home and use for a period of one week.

Check the source, transportation, and delivery of your community milk supply as to its conformance to sanitary standards.

Prepare a program for auditorium use concerning the value of maintaining a sanitary supply of milk.

TERMS AND CONCEPTS

Commercial pasteurization, enriched, grade A pasteurized milk, grade A raw milk, home heat-treating of milk, irradiated, pasteurization, skimmed milk.

SUGGESTED CONTENT

A. Why is milk such an excellent food?

1. Milk is nature's most nearly perfect food.
 - a. It contains relatively large amounts of calcium and phosphorus, an assortment of other important minerals, proteins, carbohydrates and fats, and a rich supply of vitamins A and B. If milk is enriched or irradiated it will contain an adequate amount of vitamin D.
 - b. Milk is deficient in iron and copper and is not a dependable source of vitamin C.
 - c. Skimmed milk contains as much protein and calcium as whole milk but less vitamin A which is removed with the cream. If skimmed milk is used, cod-liver oil and vegetables rich in vitamin A should be included in the diet.
2. Each young person should include at least one quart of milk in the diet each day. Adults should have at least one pint each day.
 - a. This includes milk taken as a beverage and that which is used in preparation of foods.
 - b. All age groups should include milk and milk products as part of the diet because of the presence of certain nutritive elements that may be lacking in other foods.

B. Why is milk a potentially dangerous food?

1. Milk is not only an ideal food for man but also it is an ideal food for the microscopic enemies of man.
 - a. Disease-producing organisms may get into milk either from an animal that is diseased or from human beings who handle milk.
 - b. Some of the diseases that humans may contract as a result of a diseased cow are tuberculosis and undulant fever.
 - c. Milk may be contaminated with disease-producing germs by persons who handle milk or milk products. Some of the diseases of this origin are typhoid fever, scarlet fever, diphtheria, and septic sore throat.
2. The disease-producing germs found in milk are easily killed by heating the milk to a temperature that does not change its food value. The process of heating milk, called pasteurization, is the most important safeguard against the spread of disease through the use of milk.
 - a. Other factors that contribute to a safe supply of milk are:
 - (1) Milk should come from healthy cows.

- (2) Milk should be collected in a clean and sanitary manner.
 - (3) Milk should be kept in sterile containers at low temperatures (less than 50° F.).
 - (4) Milk should be transported as soon as possible to the pasteurization plant.
- b. Pasteurized milk is used in approximately eighty per cent of American cities with a population of 10,000 or over. Many of the smaller communities are still exposed to the hazards of raw milk. In cities where all the milk is properly pasteurized, milk-borne diseases have been eliminated.
- c. Milk should be pasteurized before being used.
- (1) Commercial pasteurization in Minnesota takes place in plants approved by the Commissioner Agriculture, Dairy and Food of the state of Minnesota.
Pasteurization is the process of heating every particle of milk or milk products to a temperature of 143° F. and holding such temperature for a period of thirty minutes and then immediately cooling to a temperature of at least 50° F. An alternate process is to heat the milk to a temperature of 160° F. for a period of fifteen seconds and then immediately cooling to at least 50° F.
 - (2) Home methods of pasteurizing milk should be resorted to when commercially pasteurized milk is not available. The following is one of the methods recommended and approved by the Minnesota Department of Health and Department of Agriculture, Dairy and Food:
 - (a) Have equipment ready—A sauce pan or kettle of suitable size to handle the quantity of milk desired, a metal stirring spoon, and an accurate dairy thermometer.
 - (b) Heat to 165° F. — Put pan with milk over direct heat, stirring continuously throughout the heating process to prevent "local overheating" and formation of undesirable film. Keep thermometer in milk and watch temperature.
 - (c) Cool quickly in cold water—The minute the milk reaches 165° F., place the pan of milk in a larger pan filled with cold water. Stir occasionally with metal spoon as milk cools. When it is under 150° F., cover and stir less often. Cool to 60° F. or less.

C. How can milk be protected in the home?

1. Milk may become unfit for human food by improper care in the home. Some good practices for the care of milk in the home are:
 - a. Keep milk cold but do not allow it to freeze.
 - b. Keep the top of the bottle clean. Milk may become contaminated while pouring it from the bottle.
 - c. Be sure that the receptacles into which milk is poured are clean.
 - d. Keep milk covered at all times so that it will not be exposed to flies, dust and odors.
 - e. Keep milk in the original bottle or container. Do not pour into a pail or pitcher for storage.
 - f. Accept only fresh pasteurized milk that is delivered in sealed containers.

D. Is it possible for consumers to be certain that the milk they drink is safe?

1. Milk is usually graded according to sanitary quality and nutritive value.
2. The U. S. Public Health Service publishes semiannually a revised list of communities meeting the milk requirements of the Public Health Service Milk Ordinance and Code. The ordinance recognizes two grades of milk: Grade A pasteurized and Grade A raw milk.
3. To insure the safest possible milk supply, every community should have effective supervision of:
 - a. Dairy farms supplying milk to the community
 - b. Collecting stations supplying milk to the community
 - c. Transportation lines delivering milk to the community
 - d. Pasteurization and distributing plants servicing the community
 - e. Retail stores servicing the community

UNIT XXII

WHAT ARE CONSIDERED SATISFACTORY METHODS OF REMOVAL AND DISPOSAL OF GARBAGE AND SEWAGE?

Suggested Time: Five Class Periods

OBJECTIVES

- To develop an understanding of sanitary methods of home waste disposal.
- To be familiar with the common methods of sewage disposal in both rural and urban areas.
- To appreciate the many problems of satisfactory garbage and sewage disposal.

SUGGESTED ACTIVITIES

Recognize the Problem

- Investigate the conditions existing in the home, school, and community with reference to disposal of rubbish, garbage and sewage.
- Report on the problems of sanitation at a summer camp and how they are met.

Develop the Problem

- Visit a sewage treatment plant. Arrange for the caretaker to explain the various processes that the sewage goes through.
- Investigate the methods used for waste disposal in schools located where there is no community sewerage system. Make recommendations for possible improvement.
- Formulate rules for proper garbage and sewage disposal at a summer camp.
- Draw a diagram to show a desirable location for a privy in relation to the house and source of water supply. Indicate distances and nature of the soil.
- Read about and compare ancient methods of garbage and sewage disposal with modern methods.

Evaluation

- Describe the most practical methods of sewage disposal for a rural home without running water in the house, a home in a rural community with water supply but no sewerage, and for a summer cottage or camp.
- Plan a publicity campaign to promote sanitary procedures in disposing of rubbish and garbage in the community.

TERMS AND CONCEPTS

Bacterial decomposition, cesspool, chemical closets, chlorination, filtration, garbage, incinerator, oxidation, pollution, privy, rubbish, septic tank, settling tanks, sewage, sewer, sewerage.

SUGGESTED CONTENT

A. What are satisfactory methods for home waste disposal?

1. Rubbish and ashes are usually placed in a metal container, separate from garbage.
 - a. Much of the combustible rubbish material may be burned in an incinerator.
 - b. Ashes may be used to fill low lands and swampy places.
 - c. Tin cans, bottles and other noncombustible refuse are also frequently used for filling purposes in places designated by communities as dumps.
2. Garbage, consisting of food wastes, may be disposed of in several ways. Regulations for garbage disposal vary in different communities.
 - a. Garbage should be collected in a metal container provided with a tight cover. Garbage not properly cared for may attract flies, mice and rats that carry disease germs.
 - b. Garbage cans should be cleaned frequently with soap and hot water.
 - c. Garbage is usually wrapped in newspapers before being placed in metal containers.
 - d. One of the more recent methods of garbage disposal is to install a device in connection with the kitchen sink which grinds the garbage into small pieces and flushes it into the sewer along with waste water.
 - e. Communities, providing regular garbage collection, must provide for its disposal.
 - (1) The most sanitary method is to burn the garbage in large incinerators.
 - (2) Reduction plants may be used where the garbage is cooked and the fats skimmed off and sold. The residue is used for fertilizer. The process is usually not economical.
 - (3) The garbage may be hauled to a dumping ground and covered with dirt.
 - (4) Garbage may be used for feeding animals. Special precautions must be taken to prevent its contamination.

- (5) In communities near the sea coast, garbage and rubbish may be hauled out to a considerable distance on the ocean in scows and dumped. This may result in pollution of the water for city water supplies, fisheries, and beaches.
 - f. In rural areas and communities not providing regular garbage collection, the methods for disposal most frequently used are:
 - (1) Feeding table scraps to chickens, pigs and other animals.
 - (2) Burying the garbage in a special pit provided for this purpose.
 - (3) Burning the garbage in an incinerator adapted for this purpose.
 - g. In camping and picnic areas garbage should be buried or burned.
- B. How was sewage disposed of in large communities before public sewerage systems were provided?
1. During the days when Rome was at its height, sewage, consisting only of surface water, was drained off. The "Cloaca Maxima" (main sewer) was used to drain a marsh. This type and other so-called sewers of antiquity were drains rather than sewers. Their function was to drain off water from low places and carry off surface water. They did not carry body and household wastes.
 2. Up to the nineteenth century sewage was generally drained off by gutters.
 - a. Wastes were collected in buckets in the houses and then thrown through open windows to the gutters along the narrow streets.
 - b. In Paris it is reported that householders were often very inconsiderate of the safety and comfort of the passerby when throwing out wastes.
 3. Modern-day sewage disposal methods were first developed in England about one hundred years ago. Today the United States is among the leading nations in providing modern plumbing and sewerage systems; yet the primitive, insanitary conditions of waste disposal still existing throughout this country are almost unbelievable.
- C. How are body wastes disposed of without sewers?
1. The septic tank usually is a large concrete basin built underground consisting of one or more compartments. It provides a satisfactory method of disposal of body wastes in homes provided with running water.

- a. Body wastes, as well as liquid wastes from the kitchen sink, bath tub and laundry tubs, are flushed into the first compartment of the septic tank. Here the solids settle out and are acted upon by bacteria and converted into a non-odorous form
 - b. The liquids then drain through an outlet pipe into drain tile located under the surface of the ground and leading away from the house. The construction and location of the drain tile is determined by the nature of the surrounding soil. Gravel or sandy soil provide better filtration than clay or heavy loam soil.
 - c. The septic tank should be located at least fifty feet, and preferably farther, from any source of water supply. The distance depends upon the nature of the soil and its suitability for satisfactory filtration.
2. The cesspool is constructed somewhat like a large well with the sides made of concrete tile, bricks or stones and arranged so that water may pass into the surrounding soil. Cesspools are used for homes provided with running water.
 - a. The solids settle to the bottom and are greatly reduced in volume by bacterial action.
 - b. A cesspool properly constructed in porous soil may serve as a satisfactory method of sewage disposal for a long period of time.
 - c. A cesspool should be located so as to avoid any possible contamination of drinking water supply.
3. Chemical closets may be used inside the house where running water is not provided. They consist of a porcelain jar or iron tank.
 - a. The excreta are subjected to a strong solution of caustic soda which dissolves and disinfects the material and destroys odors.
 - b. Tanks holding several months storage may be emptied by drainage into a cesspool.
4. A sanitary privy may be used outside the house. To be satisfactory it should meet the following requirements:
 - a. The pit should be approximately five feet deep and lined with wooden curbing projecting one inch above the ground level to prevent entrance of flies. A one-half inch space should be left between the board of the curbing below a depth of one and one-half feet to facilitate the passage of liquids into the soil.

- b. The privy should be conveniently located with reference to the house and placed where it will not contaminate a water supply.
 - c. Flies, insects, rats and other animals should not be able to gain access to the waste materials. The building should be constructed with a floor above ground level, a tight door that closes automatically, seat covers that close when not in use, and durable screens over all openings for ventilation.
 - d. The seat, floor, and ground adjacent to the privy should be kept clean.
 - e. Toilet paper should be provided as it dissolves more readily than other paper, thus reducing the accumulation of solids in the pit.
 - f. When the pit is filled to within one and one-half feet of the top, a new pit should be dug and curbed, and the building moved over it. Moving is facilitated by proper construction of the building and the concrete slab it rests on.
 - g. The old, used pit should be filled to the ground line with clean earth.
- D. How is sewage disposed of in communities with a sewerage system?
- 1. Sewage may consist of surface water from streets; household wastes from sinks, bath tubs, laundry tubs and toilets, and waste water from industrial plants.
 - 2. Sewerage systems collect domestic and industrial wastes and by means of conduits (sewers) provide for their flow to a point of discharge, which is usually a river or large lake. Because the dilution is usually not sufficient to allow this without serious objection sewage treatment is necessary in most situations. The following methods of sewage treatment are most common:
 - a. Screening
 - b. Sedimentation
 - c. Chemical precipitation
 - d. Biological oxidation
 - e. Disinfection with chlorine
 - 3. Any system of sewage treatment will usually involve a combination of several of the above processes. A satisfactory treatment of sewage will produce an end-product that is neither objectionable nor dangerous to health.
- E. What danger to the home or community may result from improper garbage and sewage disposal?

1. Food may be contaminated by germs carried by flies and rodents after they have had access to insanitary garbage cans, privies, and sewerage systems. Communicable diseases transmitted by these carriers are typhoid fever, dysentery, cholera and diarrhea.
2. Water supplies may become polluted because of seepage or surface drainage from poorly constructed and located privies, cesspools and septic tanks.
3. Pollution of lakes and streams by improperly treated sewage may render them unfit for recreational purposes and for industrial uses. Pollution may destroy fish and other aquatic life and become such a public nuisance as to result in a depreciation of property values.

PART 3

PROTECTION IS DESIRABLE

SAFETY

FIRST AID

DRIVER EDUCATION

SECTION EIGHT

SAFETY

Suggested Time: Fifteen Class Periods

- Unit XXIII. Why Is the Safety Problem of Such Great Concern? (One Class Period)
- Unit XXIV. What Are the Common Causes of Falls? (Three Class Periods)
- Unit XXV. How Can Everyone Help to Prevent Fires and Related Accidents? (Three Class Periods)
- Unit XXVI. What Careless Practices in the Use of Firearms and Other Weapons Cause Accidents? (Two Class Periods)
- Unit XXVII. How Can Accidents from the Use of Electrical and Mechanical Devices Be Prevented? (Two Class Periods)
- Unit XXVIII. What Are the Common Causes of Poisoning? (Two Class Periods)
- Unit XXIX. What Hazards Do Water and Ice Present? (Two Class Periods)

OVERVIEW

Serious hazards exist in the home, on the farm and in public places. These hazards may rob the individual of the complete enjoyment of life because of the ever-present threat of accidents. The pupil, realizing that more deaths result from accidents for the age group one to nineteen than from any other source, should consciously develop habits of safety.

The fact that the majority of accidental deaths and injuries are avoidable implies that the average individual is evidently not safety-minded as he carries out duties at home, at school and at work, drives an automobile, crosses the street, uses some complicated machine, or participates in recreational activities.

Safety is concerned with the conservation, not the destruction, of human life. A knowledge of the causes and preventive measures of common accidents is valuable, but the emphasis should be placed on the actual practice of safety habits thus adding many happy years to life.

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Sources of Free and Inexpensive Materials (See general bibliography for addresses of publishers.)

Aetna Life Insurance Co.

Issues pamphlets for general student distribution, teachers' guide books and safety posters. Also has safety films and slides available for school showings. Material is free.

American Red Cross

Annotated bibliographies:

Visual aids (ARC 1062). Free.....All units

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Safety in the home. Free.....Units XXIV, XXV, XXVII, XXVIII

Institute of Makers of Explosives

Safety work consists largely in publicizing dangers of blasting caps. Issues posters and pamphlets dealing with this subject. Free.....Unit XXVI

International Association of Electrical Inspectors

How to safeguard electric service in the home.

FreeUnits XXV, XXVII

Electric service with safety. Single copy free. 2c per copy in quantities.....Units XXV, XXVII

International Harvester

- Farm safety.....Unit XXIII, XXIX
- The best way to fight fire is to prevent it from starting. Free.....Unit XXV

National Board of Fire Underwriters

- Does extensive work in the field of fire prevention and protection. Complete list of publications free upon request.....Unit XXV

National Conservation Bureau

- Does work in all fields of safety education. Sells, at small cost, copies of standard tests covering various fields of safety. Complete list of publications free upon request.....Units XXIII-XXIX

National Education Association

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National Fire Protection Association

- Has an extensive list of publications, posters, and inspection blanks designed for school use and containing no advertising. Minimum charge for most of the publications. Complete list sent free upon requestUnit XXV

National Rifle Association of America

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- Issues publications, posters, safety packets, films, etc., dealing with all aspects of school safety. List of publications available free upon request.
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 Safety in physical education and recreation. 50c....Unit XXIV
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National Society for the Prevention of Blindness

Does extensive work in prevention of eye accidents. Publishes pamphlets dealing with hazards in workshops, in play, in athletics and so forth. A small charge is made for certain of these publications. Complete list free upon request.

Sporting Arms and Ammunition Manufacturers' Institute

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Affiliated Aetna Life Companies, Motion Picture Bureau

- Sentinels of safety. 9 min. 16 mm. sound. free....Units XXIV, XXV,
 XXVII, XXVIII

Film Preview

- Fire. 35 mm. Slidefilm. (filmstrip) 30c.....Unit XXV
 Fire room precaution. 35 mm. Slidefilm. (filmstrip) 30c.....Unit XXV
 Safety in the home. 35 mm. Slidefilm. (filmstrip) 30cUnits XXIV, XXV,
 XXVII, XXVIII
 Safety in the home. 25 plain and 5 colored lantern slides. \$1.....Units XXIV, XXV,
 XXVII, XXVIII
 Safety in sports and recreation. 20 plain and 10 colored lantern slides. \$1.....Units XXIV, XXIX
 The use of fire extinguishers. 35 mm. Slidefilm. (filmstrip) 30c.....Unit XXV

Institute of Makers of Explosives

- Blasting cap. 16 mm. color. sound. free.....Unit XXVI

*For teachers only.

University of Minnesota, Bureau of Audio-Visual Instruction

Dangerous dusts. 1 reel. 16 mm. sound. 50c.....	Unit XXV
Fire prevention. 1 reel. 16 mm. silent. 75c.....	Unit XXV
Fire safety. 10 min. 16 mm. silent. 75c.....	Unit XXV
Heads up. 2 reels. 16 mm. sound. \$2.....	Unit XXIX
More dangerous than dynamite. 1 reel. 16 mm. sound. \$1.....	Unit XXV
Play in the snow. 1 reel. 16 mm. sound. \$1.....	Unit XXIX
Safe use of tools. ½ reel. 16 mm. sound. 50c.....	Unit XXVII
Safety in the home. 10 min. 16 mm. sound. \$1.....	Units XXIV, XXV, XXVII, XXVIII
The seventh column (accidents). 10 min. 16 mm. sound. \$1.....	Units XXIII, XXIV, XXV, XXVII, XXVIII

University of Wisconsin, Bureau of Visual Instruction

Safety at home. 8 min. 16 mm. silent. 50c.....	Units XXIV, XXV, XXVII, XXVIII
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UNIT XXIII

WHY IS THE SAFETY PROBLEM OF SUCH GREAT CONCERN?

Suggested Time: One Class Period

OBJECTIVES

To recognize that the majority of accidental deaths and injuries are avoidable.

To create the desire to practice safety daily.

To appreciate the seriousness of the safety problem.

SUGGESTED ACTIVITIES

Recognize the Problem

List the needless risks taken during the past week by class members and other citizens of the community which were observed by pupils. Discuss in class the nature of these risks and the extent of injury that may accompany each.

Develop the Problem

Elicit spontaneous definitions of safety. Seek to broaden the interpretation of the term by the pupils to include all aspects of safety.

Evaluation

Prepare a paper on the development of the modern safety problem in some specific phase, for example, in industry, transportation, recreation, etc.

TERMS AND CONCEPTS

Automobile, carelessness, electrical devices, fatigue, haste, hazard, ignorance, invention, law of averages, life expectancy, machine age, mechanical devices, reaction time, recreation, safety, sanitation, transportation, urbanization.

SUGGESTED CONTENT

A. How did the modern safety problem develop?

1. The Industrial Revolution brought benefits and problems. The mass production of goods allowed all classes of people to share in the higher standard of living, but death and crippling injuries increased tremendously in the factories, which lacked proper safety devices.

2. The Machine Age was accompanied by new transportation problems as the mode of travel became varied and the rate of travel increased. The automobile alone killed approximately 40,000 people in 1941 and injured more than a million in the United States. (Accident Facts, 1942)
3. The development of factories encouraged people to move from the country to the city. This urbanization became the root of the problem of safe and adequate housing, safe water and food supply, sanitation, wholesome recreation and many more.
4. Industry, transportation and urbanization are typical examples of the numerous factors involved in the development of the modern safety problem. They provide some of the hazards which snuff out lives and maim bodies each year. They make one realize that the gains in life expectancy made by medical science appear worthless unless something is done about safety today.

B. Why is the accident toll so great?

1. **Ignorance** is a vital factor as a cause of accidents. Man's training in the use of electrical and mechanical devices in the home and factory has not kept pace with the rapid rate of invention. As a result, thousands become victims of their own lack of knowledge and skill.
2. **Fatigue** decreases reaction time. A tired person is more likely to be hurt because he does not sense danger as quickly as a rested person and will react at a slower rate while trying to avoid the peril.
3. **Carelessness** prompted by the thought that "it won't happen to me" leads to a countless number of accidents every day. Taking a chance makes the law of averages operate. Accidents do not just happen; they are caused.
4. **Worry** often leads to hasty and dangerous actions. One does not pay strict attention to what is going on when preoccupied.

C. How does the safety problem affect young people?

1. Young people should be concerned about the safety problem because accidents lead as the cause of death in the age group, 1-19. (Accident Facts, 1945)
2. For every person killed in an accident, several are seriously injured.
3. The actual practice of safety habits is a protection against unnecessary injuries and disease.

UNIT XXIV

WHAT ARE THE COMMON CAUSES OF FALLS?

Suggested Time: Three Class Periods

OBJECTIVES

To recognize the common causes of falls.

To develop a safety consciousness which will result in the formation of desirable habits and in the elimination of fall hazards.

SUGGESTED ACTIVITIES**Recognize the Problem**

Check the home for fall hazards. Chart the hazards that are found and the type of correction made.

Discuss: Disorder in housekeeping may cause an accident.

Develop the Problem

Demonstrate the use of jar rubbers or other rubber pieces as anchors for scatter rugs.

Demonstrate how to wax a floor correctly. Emphasize the fact that a thin coat of wax should be applied and thoroughly rubbed.

Evaluation

Develop a traffic system which will eliminate fall hazards due to crowded steps and halls in the school. Submit the plan to the student council or the safety council for adoption in school use.

Write short articles on safety for the local and school newspapers treating a different phase of safety each week.

TERMS AND CONCEPTS

Apparatus, balcony, banister, condemned, elevator, escalator, farm equipment, farm machinery, gymnasium, haymow, handrail, jumping, ladder, lighting, light cord, obstacles, obstruction, overloading, playground, porch, push, railing, rubber mat, safety gate, screens, shower room, soap, steps, tools, toys, trapdoor, trestles, trees, walls.

SUGGESTED CONTENT**A. What are the common causes of falls in the home?**

1. In 1941, deaths from falls numbered 25,400, one-fourth of the total of all accidental deaths. (Accident Facts, 1942)
2. A large number of falls take place on stairs and steps. This number may be reduced by carrying out the following suggestions:

Provide sturdy handrails of proper height; remove all obstructions on the steps; fasten loose metal and rubber strips securely; put a safety gate at the top and bottom of the stairway to protect small children; construct stairway with suf-

ficient headroom; close stairway doors and traps to basement; remove scatter rugs at the top and bottom of stairways; repair worn and broken steps; light the stairway adequately, and place a light switch at the top and bottom; clear ice and snow from steps; put ashes or sand on icy areas that cannot be removed; repair worn carpeting; wax stairs very lightly; walk up and down stairs; carry only a safe load up or down stairs in order that vision isn't blocked or balance lost; paint the top and bottom basement steps white.

3. Special care must be exercised on smooth or slippery surfaces to avoid falling.

Place rubber mats in the bath tub and shower; step on a heavy bath mat when leaving the tub or shower, use a safety handrail when climbing out of the tub; wax the floors with a preparation that will give a satisfactory polish without making the floor dangerously slippery; fit scatter rugs used on polished floors with nonskid devices; avoid using rugs of any kind that have worn places or turned up corners or edges; spread newspapers on a wet floor that has just been scrubbed; wipe up spilled water, soap or grease immediately; remove leaves, ice or snow from walks.

4. Serious and sometimes fatal falls result from using ladders in these foolish ways:

Overloading; standing on the front shelf; stretching oneself beyond normal reach; leaning away from instead of toward the ladder; placing the ladder on a slippery surface; substituting boxes, chairs or rockers for sound, well constructed ladders.

5. Falls occur from failure to put objects in their proper places.

Remove toys from the floor and sidewalk; keep soap in a secure container; return furniture to the customary location at night; keep shoe strings tied; hang up hoes, rakes, hose, etc., when not in use; refrain from running light cords across the floor where someone might trip over them; replace and make secure loose stones and bricks.

6. Balconies, porches and windows may be dangerous, especially for children.

Fasten window screens securely; never lean on windows or screens; keep off railings; equip all porches and balconies with strong railings, use special caution when washing windows or changing screens.

B. What fall hazards are peculiar to the farm?

1. Machinery and equipment present many opportunities for falls when the following violations are made:

Allowing children to ride on equipment; failing to put hoes, rakes, pitchforks, etc., away after use; using machinery out in the wind, rain or snow; standing on machinery in hazardous positions; climbing to make repairs; wearing loose clothing around levers, etc.; using an unsteady seat on a machine moving over rough ground; jumping down from vehicles.

2. The poor construction in certain farm buildings is hazardous. Lack of railings around the haymow and on the haymow ladder; slippery floors in the barn and milkhouse; steep windmill and silo steps; uncovered wells and cisterns; crudely built steps with no railings; lack of proper storage space for tools, boxes, grain sacks, machinery, etc.
 3. The work of the farmer presents many occasions for guarding against falls.
Spraying; picking fruit; loading wagons; stacking hay; riding and handling farm animals; shingling; painting and repairing buildings; stepping into gopher holes and soft spots.
- C. What conditions are found in the school and other public buildings which lead to falls?
1. Children and adults alike fail to consider the safety of others by:
Running up stairs; pushing and shoving; carrying cumbersome bundles which block vision or stick out; cutting in front of others; failing to use the banister or handrail; failing to watch their footing when entering or leaving elevators; using escalators carelessly; rushing through doorways without looking; failing to keep to the right on stairs and in halls or aisles.
 2. The gymnasium hazards can be reduced.
Assist others in tumbling and apparatus work; place proper mats around apparatus; walk down stairs and through doorways; keep obstacles off the floor; inspect and repair equipment regularly; take care in purchase of safe equipment; discuss safety measures to be observed for each activity; remove excess wax from floors; prevent rough play or carelessness; warm up properly before activity; stop before exhausted.
 3. Carelessness in shower room or swimming pool may result in serious falls.
Running in shower room; running around deck of pool; pushing; crowding on swimming pool ladder; shoving others off the diving board.
- D. What playground and recreational conditions exist which often result in falls?
1. Children often fail to consider the dangers in climbing.
In trees; on fences; on buildings under construction; on old and condemned structures; on high bridges and trestles; near steep banks; on insecurely fastened ropes; on shaky, unstable ladders; on ledges, retaining walls, box cars, water towers, silos, windmills, farm machinery.
 2. Careless habits in the use of equipment cause falls.
Overloading swings, trapezes, etc.; crowding and shoving on steps and runways; leaving balls, bats, etc., lying around; running on unfamiliar grounds, running in the dark; playing jokes and tricks, climbing from cars hastily, running while carrying sharp objects.

UNIT XXV

**HOW CAN EVERYONE HELP TO PREVENT FIRES
AND RELATED ACCIDENTS?**

Suggested Time: Three Class Periods

OBJECTIVES

To build up habits and attitudes of carefulness and caution regarding fire.
To recognize the causes and preventive measures of accidents related to fire.

SUGGESTED ACTIVITIES**Recognize the Problem**

Construct a home inspection blank in class. Have each pupil check fire hazards found in his home. Have class summarize the reports.

Make a survey of the class to learn how many fires have occurred in their homes and the causes of the fires.

Develop the Problem

Make a fire extinguisher and demonstrate its use.

Invite the local fire chief to tell the class about the local ordinances and regulations for the control of fires (where to burn rubbish, how close together houses may be built, material used, electrical wiring regulations, etc.).

Place a glass jar over a lighted candle, to show that fire cannot burn without oxygen, and note how quickly the flame goes out.

Evaluation

Plan a "clean up" campaign. Through articles, posters, and talks make the campaign reach out into homes and the community.

Explain how to escape from a burning house.

Conduct a fire drill in school, blocking several exits to see if the pupils can remain calm and meet the emergency situation.

TERMS AND CONCEPTS

Accumulation, appliance, benzine, bonfire, burns, campfire, cigarettes, combustible, fireproof, flues, incendiarism, inflammable, kerosene, naphtha, scalds, spontaneous combustion.

SUGGESTED CONTENT

A. What precautions can be taken to prevent fires in the home?

1. The safe construction of buildings is important in the prevention of fires.

- a. Use fireproof materials.
 - b. Use high grade materials.
 - c. Employ high standards of construction.
 - d. Secure proper installation of electricity. (Check periodically making the necessary repairs immediately.)
 - e. Construct a fireproof roof.
2. Stoves, furnaces, heaters, lamps, stovepipes, boilers and fireplaces may be causes of fire if improperly used.
 - a. Screen all fireplaces.
 - b. Inspect chimney and flues often for defects.
 - c. Clean soot from stoves, furnaces, flues and chimneys regularly.
 - d. Put ashes in a metal can, never in a wooden container.
 - e. Never overheat a stove or furnace.
 - f. Cover furnace pipes with asbestos, especially those near a combustible material.
 - g. Inspect controls frequently, even the automatic controls.
 - h. Use dampers and drafts properly.
 - i. Never use kerosene or gasoline to start a fire.
 - j. Have all appliances installed and checked only by a skilled person.
3. Petroleum fuels are highly inflammable.
 - a. Never store an inflammable liquid in the house.
 - b. Label all tanks.
 - c. Wipe off any kerosene, gasoline or oil that might spill on the outside of the supply tank.
 - d. Fill the supply tanks out-of-doors.
 - e. Never fill a supply tank completely because liquids may expand in a heated room.
4. The use of inflammable liquids for dry cleaning, window washing, etc., is very hazardous.
 - a. Gasoline, benzine and naphtha are dangerous to use even out-of-doors.
 - b. A fire can result from using a small amount of the liquid to remove a spot.
 - c. The friction resulting from rubbing windows with gasoline is likely to produce sufficient heat to ignite the gasoline vapor in the air.
 - d. Noninflammable cleaning fluids are recommended for use in a well-ventilated room where no flame is present.

5. Spontaneous combustion is self-ignition in a substance as a result of chemical action.
 - a. Place rags soaked in grease, oil or paint in a metal container.
 - b. Clean up all rubbish and refuse.
 - c. Dry hay and grain sufficiently before storing.
6. Fires occasionally are started by incendiarism or arson, the malicious burning of a building or other property. This is a felony, punishable by law, so it should be reported to the proper authorities immediately.
7. The following suggestions will help to prevent fires, burns and deaths caused by matches and smokers:
 - a. Use only safety matches.
 - b. Carefully put out matches, cigarettes and cigars before discarding.
 - c. Never empty ash trays in waste baskets.
 - d. Keep matches of all kinds out of the reach of children.
 - e. Strike a match away from yourself.
 - f. Close the container before striking the match.
 - g. Store matches in a metal container.
 - h. Do not carry matches loose in pockets.
8. Improper use of electrical equipment may cause fires. Overheating irons; leaving hot irons near combustible materials, failing to remove the plug of an electrical device after use; using worn cords and broken plugs; running cords under rugs and doors or over radiators; doing makeshift repairs on electric equipment; using pennies for fuses.

B. What conditions in the school may cause fires?

1. Shops, home economic rooms and laboratories may have special fire hazards.
 - a. Protect the woodwork exposed to heat with metal.
 - b. Supervise the storage of chemicals, paints and varnishes during laboratory experiments.
 - c. Use stoves and hot plates with discretion.
 - d. Light matches in the building only in supervised class activity.
 - e. Clean up the accumulation of shavings in the workshop daily.
 - f. Know how to make an orderly exit from any part of the building in case of fire.

2. The boiler and storage rooms often contain the following inflammable materials:

Large quantities of coal or oil; oily rags and mops; paints and varnishes; cleaning fluids and polishes.

C. What fire hazards are especially prevalent on farms?

1. The farm home may have hazards in addition to those found in urban homes:

Kerosene, gasoline, wood and coal stoves; kerosene and gasoline lamps; more makeshift wiring.

2. Barns and other outbuildings may catch on fire because of one of the following reasons:

Smoking in the barn; careless use of lanterns; lightning; spontaneous combustion of green or wet hay; defective electrical wiring; use of a gasoline engine in an outbuilding; overheated stoves; burning rubbish.

D. What careless habits of people engaged in recreation result in fires?

1. Careless use of cigarettes, matches, cigars and pipes causes fires.

Throwing matches, cigar and cigarette butts, and ashes out of car windows or tossing them aside carelessly; dropping off to sleep while smoking; putting a lit cigarette or cigar down and forgetting about it; dropping lit matches.

2. Careless use of camp and bonfires causes fires.

Building fires too big to keep under control; building fires where sparks scatter to trees, bushes, and nearby grass; going away from campfires and bonfires without extinguishing them; failing to extinguish a fire completely; building fires too close to buildings.

E. How can the kitchen be made a safe place in which to work?

1. The following rules should be observed when using hot liquids:
 - a. Pour liquids slowly into the cooking pans.
 - b. Keep all hot liquids out of reach of children.
 - c. Use a deep kettle not more than two-thirds full when deep-fat frying.
 - d. Direct spout away from person when pouring a hot liquid.
 - e. Never subject glass containers to sudden temperature changes.
 - f. Use sufficient water while cooking.
 - g. Never pass a cup of hot liquid over someone sitting at a table.

2. The following rules should be observed when canning:
 - a. Check over all materials such as jars and lids before using; use none with cracks or chips.
 - b. Use a large kettle to prevent liquid from boiling over.
 - c. Use sturdy tongs for lifting.
 - d. Handle paraffin with care.
 - e. Exercise special caution in the use of the pressure cooker and other canning equipment.

F. What should be done if a fire occurs?

1. When attempting to put out a fire, remember to attack the fire at its base, the place where the flames originate.
2. Some small fires can be beaten out with a broom, rug, or some similar object; or can be extinguished by shutting off the air supply with sand, dirt, rug or blanket.
3. Fire may be kept from spreading by pouring water on the surrounding area.
4. Flaming grease is never extinguished with water. Use salt, flour, soda, or cover the utensil with a metal lid.
5. Chemical fire extinguishers are very useful in putting out fires in homes and public buildings alike. There are different kinds of extinguishers for use on different types of fires. The label on the fire extinguisher will indicate the type so that proper use of it can be made.
6. Fire should be reported to the proper authorities.
 - a. Call the operator and tell her that you have a fire to report. She will connect you with the fire department. Be sure to explain exactly where the fire is located and the nature and extent of the fire. Do not hang up until absolutely sure that the fire department officials have all the necessary information.
 - b. After using a fire alarm box, be sure that someone stays there until the fire truck arrives so that the firemen can be directed to the fire.
 - c. Never send in a false alarm as a joke.
7. The best way to put out a fire in clothing is to wrap a rug, blanket, coat, or something similar around the body, lie down, and roll.
 - a. If out-of-doors, lie down on the ground and roll over and over.
 - b. If a person whose clothing is on fire starts to run, do not take hold of him; rather trip him so that he will fall to the ground; pull off your coat or some other garment and try to smother the flames.

8. The following precautions should be observed when escaping from a burning building:
 - a. Close all windows and doors to prevent air from reaching the flames.
 - b. Tie a wet cloth over the mouth and nose to prevent breathing the smoke. A wet cloth is **not** a gas mask, however.
 - c. Crawl along the floor, using the wall as a guide.
 - d. When every exit is cut off by fire, go to a window and seek help. Do not jump unless the distance to the ground is very short. A rope can be improvised by tearing strips from a sheet and knotting them together. Tie one end to a heavy piece of furniture and descend.
9. A life should be saved before property.
10. A knowledge of the first aid treatment for burns is valuable. (Unit XXX)
11. If a person who has been rescued from a burning building is unconscious, artificial respiration should be administered to him immediately. (Unit XXX)

UNIT XXVI

**WHAT CARELESS PRACTICES IN THE USE OF
FIREARMS AND OTHER WEAPONS
CAUSE ACCIDENTS?**

Suggested Time: Two Class Periods

OBJECTIVES

- To recognize the dangers of all kinds of firearms, bows and arrows, and slingshots.
- To develop attitudes which will result in the formation of safe habits in handling weapons.

SUGGESTED ACTIVITIES**Recognize the Problem**

- Make a class survey to determine how many have handled a gun and have gone hunting. What safety rules were observed?
- Discuss: Is a BB gun ever dangerous? A 22 rifle? A slingshot? A bow and arrow?

Develop the Problem

- Write to the Minnesota Society for the Prevention of Blindness for information on the damage and injuries caused by BB guns.
- Have someone qualified in gun handling discuss and demonstrate how to care for and handle a gun.
- Form a Junior Rifleman's Club.
- Display bows and arrows of different lengths. Explain the importance of selecting the bow and arrows according to the height, length of arms and strength of the archer.

Evaluation

- Draw up a "Hunter's Code."
- Plan and present an assembly program on gun safety to the entire school. Use wooden guns. Demonstrate the wrong and then the right ways of handling a gun. Have the assembly program just preceding hunting season.

TERMS AND CONCEPTS

- BB gun, blind, bow and arrow, bowstring, break, breech, glance off, lacerations, loaded, muzzle, pellets, safety lock, slingshot.

SUGGESTED CONTENT

A. How many deaths are caused by firearms?

1. In 1943, 2318 persons died from firearm accidents in the United States. (Accident Facts, 1945)
 - a. In the age group, 10-14, 291 were killed.
 - b. In the age group, 15-19, 419 were killed.
2. In 1944, 53 persons were killed by firearms in Minnesota. (Minnesota Dept. of Health)

B. Why are BB guns and 22 rifles very dangerous?

1. Pellets from BB guns may penetrate the skin, and especially the eye structure.
2. When the eye is penetrated by pellets, severe hemorrhage, lacerations, and cataract may result.
3. A recent survey in Minnesota revealed that out of 121 eye injuries caused by BB guns 52 eyes were left blinded and 50 others were partially blinded. (Minnesota Society for the Prevention of Blindness)
4. The 22 rifle bullet will travel up to a mile and may glance off at an angle from flat, hard surfaces and water.

C. What precautions may be taken to prevent accidents from all types of firearms?

1. Keep guns where children cannot get at them.
2. Never point a gun at anyone, even if it is a toy or is unloaded.
3. Do not look into the muzzle of a gun.
4. Have a good safety device on the gun.
5. Do not lean a gun against a fence, a tree, or set it up in such a way that it might fall.
6. Never take a loaded gun into a car or a house. (The Minnesota state law requires that a gun must be unloaded and in a case or dismantled when being transported in a motor vehicle.)
7. Point the muzzle toward the ground or sky when the gun is being carried.
8. Lay the gun on the ground on the other side of the fence before climbing through or over the fence.
9. Keep the muzzle of the gun clean. Do not allow it to become clogged with snow or mud.

10. Never carry a cocked gun unless the safety lock is on.
 11. Do not use a gun to club game out of the brush.
 12. Break the gun before cleaning it; look through the breech; remove cartridges.
 13. Never climb a tree with a loaded gun.
 14. Be sure of your target before pulling the trigger.
 15. Never leave your gun unattended unless it is first unloaded.
- D. What does the law state regarding the use of firearms by anyone under the age of fourteen?
- Minnesota Statutes, Section 615.10, provides: "No minor under the age of 14 years shall handle, or shall have in his possession or under his control, except while accompanied by or under the immediate charge of his parent or guardian, any firearm of any kind for hunting or target practice or any other purpose. Every person violating any of the foregoing or aiding or knowingly permitting any such minor to violate the same shall be guilty of a misdemeanor."
- E. What precautions should be taken with a bow and arrow and a slingshot?
1. An arrow and a slingshot should never be aimed at another person or at a spot where people are likely to cross the line of flight.
 2. A stone from a slingshot may glance off an object and seriously hurt someone near by.
 3. Arrows should be the right length for the archer.
 4. The archer should wear an arm guard on the left forearm to prevent being whipped by the bowstring.

UNIT XXVII

HOW CAN ACCIDENTS FROM THE USE OF ELECTRICAL AND MECHANICAL DEVICES BE PREVENTED?

Suggested Time: Two Class Periods

OBJECTIVES

- To develop a sense of responsibility in recognizing and removing hazards due to electrical and mechanical devices.
- To gain knowledge which will help develop habits of safety while working with machinery.

SUGGESTED ACTIVITIES

Recognize the Problem

Invite an electrician to talk to the class about the safe use of electricity.

Ask the rural members of the class to name and explain different types of mechanical equipment on the farm. Let the class determine the potential hazards of each piece of equipment.

Develop the Problem

Ask the science or shop teacher to perform some experiments showing the dangers of live wires, loose connections, etc.

Find statistics on the number of fatal and nonfatal accidents due to improper use and construction of mechanical devices and machinery on the farm.

Evaluation

See how many mechanical and electrical hazards can be discovered and corrected in the home.

Make a series of pictures to show how electricity can be a help when properly used.

TERMS AND CONCEPTS

Axe, band saw, binder, circuit, circular saw, combine, conveyor, corn cultivator, corn planter, disk, electrical device, electric fence, electrician, flywheel, frayed gear, harrow, hayrack, ice pick, jig saw, jointer, knives, lathe, lawnmower, light cord, mechanical devices, milker, mower, picker, pins, planes, plow, pump, safety devices, scissors, scythe, separator, sewing machine, shaft, sickle, spreader, threshing machine, tractor, washing machine, wet clothing, wrench.

SUGGESTED CONTENT**A. What are electrical and mechanical devices?**

1. An electrical device pertains to any aspect of electricity which produces, contains, or is operated by electric power.
2. A mechanical device pertains to any machinery and equipment involving manual operation. It may be a simple can opener or a complicated motor.

B. What electrical and mechanical devices which may lead to injury are found in the average home?

1. The kitchen contains many pieces of equipment with sharp edges.

Put knives in holders; keep scissors, pins, and needles in a special and safe place; use with caution ice picks, razors, glass, jar covers, tin cans, can openers, cover tighteners, etc.; pad or file sharp corners and ragged edges wherever possible; construct wide storage shelves with rounded edges.

2. Varied tools and electrical devices are found in or about the home. Some of these include:

Saws, hatchets, axes, wrenches, pliers, screw drivers, sewing machines, lawnmowers, washing machines, manglers, irons, toasters.

3. The following errors with electrical equipment often lead to injuries and, sometimes, death:

Improperly installed equipment; handling electrical equipment with wet body, shoes, or clothing; use of cheap materials and inexperienced persons for wiring installations; careless use of electrical equipment; overloading the circuit; failure to inspect, repair and replace equipment.

C. What are some of the causes of the high rate of accidents due to electrical and mechanical devices on the farm?

1. The farmer does not always have an opportunity to develop skill in the use of all the machines on the farm because he must use a variety of complicated machines each day; such as, pumps, tractors, milkers, separators, etc.
2. Many specialized machines are used only for a relatively few days each year so the farmer often forgets some of the safe principles of operation. These machines might include:
Plow, harrow, disk, corn planter, corn cultivator, picker, threshing machine, combine, potato planter, potato digger, hay-rake, binder, mower, spreader, sickle, etc.
3. Careless habits on the part of farmers are responsible for the majority of farm equipment accidents.
Wearing loose clothing around belts, shafts, flywheels and

conveyors; making repairs on a running machine; wearing torn or frayed gloves, trousers, sleeves; stepping over belts and other moving parts; removing safety devices; leaving machine in gear; refilling with gasoline when the motor is running and the engine is hot; riding on crossbars; doing only makeshift repairs; checking over equipment too hastily; working after dark; working when fatigued; dismounting the vehicle while the motor is running; swinging a scythe toward the body; cutting toward the body with a knife; forgetting to put the pitchfork in a barrel or other safe storage place.

D. How can accidents due to electrical and mechanical devices be reduced in schools and other public buildings?

1. The careful observation of safety rules will eliminate accidents in the school shop.

Know and observe the safety rules for using the shop equipment such as band saw, lathe, jointer, plane, jig saw, circular saw; have a firm footing or stance while working with machinery; never overlift; operate a machine only upon permission; keep loose clothing and other materials away from machinery; never overcrowd work into a machine; wear goggles when doing any work dangerous to the eyes; do not play or joke in the shop; keep things in order all the time.

2. The careful observation of safety rules will eliminate accidents in the home economics room.

Cut away from body and fingers; return all equipment to its proper storage space after use; regulate stoves carefully; keep fingers away from the needle of a sewing machine and from electric beaters.

3. Strict adherence to a "Hands Off" policy will prevent most accidents from electrical and mechanical devices in public buildings.

Keep "hands off" all levers, buttons, switches; keep away from belts, flywheels, shafts; keep clothing close to body to prevent catching it in machinery; watch your step in getting on and off elevators.

E. How can accidents from mechanical and electrical devices be prevented while participating in recreational activities?

1. Children should never play on or near machines or electrical equipment. Examples of hazardous play are:
Climbing high tension towers; climbing telephone and electric light poles; breaking street lights; touching the control mechanism of vehicles; playing on or near farm and construction machinery.
2. Intricate repair work on automobiles, motors, motorcycles, sailboats, fishing equipment, and so forth should be done by a trained person, and not by a novice.

UNIT XXVIII

WHAT ARE THE COMMON CAUSES OF POISONING?

Suggested Time: Two Class Periods

OBJECTIVES

To gain a knowledge of the common causes of poisoning.

To recognize that foresight and care will prevent many accidents due to poisoning.

SUGGESTED ACTIVITIES**Recognize the Problem**

Check the medicine cabinet at home, destroying all unnecessary bottles, labeling and putting all poisons together on one shelf out of reach of children.

Enumerate on a paper the causes of poisoning; collect the lists, and make a master list on the board. Add to it as new causes become known.

Develop the Problem

Display various ways of marking bottles so that the contents can be recognized as poison (i.e., pins in the cork, bell, sandpaper tied around the bottle).

Demonstrate what should be done immediately when a person has been overcome by gas.

Evaluation

Make an exhibit of common household preparations that contain poisons.

Make a list of rules to help prevent the mistaken use of medicinal and household poisons.

TERMS AND CONCEPTS

Acid, alkalies, antiseptics, arsenic, bichloride of mercury, carbon monoxide, chemicals, corrosives, exhaust, exterminator, fumigation, inhalation, irritant, label, Paris green, poison ivy, poison oak, poison sumac, ptomaine, rodents, ventilation.

SUGGESTED CONTENT

A. What are the common causes of internal poisoning?

1. The poisonous drugs commonly taken are (Unit XXX):
 - a. Carbolic acid or phenol.
 - b. Lysol.

- c. Bichloride of mercury.
 - d. Iodine.
 - e. Arsenic or Paris green.
 - f. Strychnine.
 - g. Strong acids—sulphuric, nitric, etc.
 - h. Strong alkalies—caustic soda (lye), ammonia, etc.
 - i. Medicines used to induce sleep and relieve pain — opium, morphine, barbitol, etc.
 - j. Wood alcohol or denatured alcohol.
2. Poisonous powders and sprays for rodents and insects should be marked with "poison" labels and stored in a place where they will not be misused by children or adults.
3. The following list of household cleaning preparations sometimes contain poisonous substances and therefore should be checked and stored carefully:
- a. Bleaches, germicides, and disinfectants.
 - b. Paint removers.
 - c. Paint cleaners.
 - d. Furniture polish.
 - e. Waxes.
 - f. Plumbing cleaners.
 - g. Silver polish.
 - h. Lysol and ammonia.
 - i. Varnish.
4. Cosmetics and hair dyes may be harmful.
- a. Some cosmetics contain substances to which certain individuals are allergic.
 - b. Labels on hair dyes must bear the name of the manufacturer and the contents of the dye.
 - c. Hair dyes are not recommended for use because of the danger of the dye getting in the eyes.
5. Foods are often the cause of severe poisoning. (Unit XI)
- a. Botulinus poisoning usually follows the eating of improperly home-canned foods.
 - b. Foods that have begun to spoil cause what is commonly termed "ptomaine" poisoning.
 - (1) This type of poisoning is especially prevalent during the summer months.
 - (2) Meat, fish, and vegetables spoil rapidly. Keep these products cool and in covered containers.
 - c. Fresh fruits and vegetables should be washed carefully before storing because of the danger of germs and poisonous sprays on the exterior.
 - d. Food left in tin can will not cause poisoning provided the tin can is stored in a refrigerated place.

- e. Wild mushrooms, greens and berries should never be gathered and eaten by anyone who is not an expert in identifying the different kinds.

B. How can internal poisoning be prevented?

1. The following rules are good ones to observe in preventing poisoning in the home:
 - a. Keep all bottles labeled and never take medicine from an unlabeled bottle.
 - b. Keep all poisons on one shelf, out of reach of children.
 - c. Identify the poison drug bottles by equipping the bottles with special warning devices like labels or pins in the cork.
 - d. Never take medicine in the dark when the label cannot be read easily.
 - e. Do not pour the contents of one bottle into another bottle.
 - f. Always look at the label **three times** before taking any medicine.
 - g. Never use medicine prescribed for someone else.
 - h. Take the exact dose of medicine prescribed for you.
 - i. Never use old medicines.
2. The following rules are good ones to observe in the prevention of poisoning on the farm:
 - a. Use nonpoisonous sprays and exterminators whenever possible.
 - b. Label all boxes or bottles of poisons.
 - c. Store poisons out of reach of children and farm animals.
 - d. Never taste the contents of any bottle with questionable contents.
 - e. Use poison sprays with care. Many are dangerous if they come in contact with open cuts and scratches.

C. How should a victim of poisoning be helped? (Unit XXX)

1. Two main points are to be remembered in the treatment of poisoning:
 - a. Dilute with a large amount of fluid.
 - b. Wash out by the use of an emetic such as soap suds, salt water, soda water, etc.
2. Epsom salts may safely be given after the stomach is washed out.
3. If the poison taken was a corrosive, such as an acid or alkali, an emetic should not be given. Neutralize with a weak alkali in acid poisoning, followed by milk, olive oil, or egg white.

Neutralize with a weak acid in alkali poisoning. Keep the patient warm.

4. Heat should be applied and stimulants given if the patient has shock symptoms. In strychnine poisoning, do not give a stimulant.

D. What plants and animals cause poisoning?

1. The oil found in the roots, stems, berries and leaves of poisonous plants may cause annoying and painful irritations.
 - a. Poison ivy is characterized by a three-leaf cluster which grows as a shrub and later as a vine.
 - b. Poison oak grows more as a bush and has deeply notched leaves in groups of three.
 - c. Poison sumac is a shrub or small tree growing in swamps, with greenish-white berries.
2. The following treatment is helpful after being exposed to poisonous plants.
 - a. Wash thoroughly with hot water and strong soap several times as soon as possible after exposure to poisonous plants. Wash with rubbing alcohol; rinse in cool water.
 - b. If a rash develops, apply a paste of soap and water to the affected areas, and leave it on all night; apply calamine lotion that has a 2 per cent solution of carbolic acid added to it; or apply dressings wet with a cold solution of Epsom salts.
3. Bites of some animals, insects, and snakes cause poisoning.
 - a. A bite by a cat or dog with rabies is very dangerous and should be treated by a doctor immediately.
 - b. The itching of the mosquito and chigger bite is frequently relieved by the use of calamine lotion. The chief danger from most insect bites is infection caused from scratching them.
 - c. A poisonous snake in Minnesota is the rattlesnake. Snake bites may be prevented by wearing high-topped boots or leggings and by being very careful about putting the hands in places inhabited by snakes.

E. What can be done to prevent poisoning by inhalation?

1. The inhalation of gas, a common cause of suffocation, is dangerous because:
 - a. Oxygen is replaced by poisonous gas in the blood stream.
 - b. The breathing center at the base of the brain becomes paralyzed.

2. Dangers of gas poisoning can be eliminated by following these safety suggestions:
 - a. Have a qualified person from the gas company frequently examine gas pipes, valves, and connections.
 - b. Use iron pipe, and not rubber tubing, to connect gas appliances to an outlet.
 - c. Never ignore the odor of gas. Ventilate the rooms and call the gas company.
 - d. Watch carefully when boiling liquids on a gas stove so that they do not boil over and extinguish or partially extinguish the gas flame.
 - e. Do not leave gas valves partially open.
 - f. Allow coal gas fumes to escape before banking the fire for the night.
3. Carbon monoxide is a deadly poison.
 - a. Carbon monoxide combines with the hemoglobin of the red blood cells approximately 250 times as readily as oxygen.
 - b. The gas is difficult to detect because it is colorless, odorless, tasteless.
 - c. Carbon monoxide is found in the exhaust of motor vehicles.
 - d. The dangers of carbon monoxide can be overcome by:
 - (1) Never running an automobile motor in a closed building.
 - (2) Frequently inspecting and repairing any leaks in the exhaust pipe of the automobile.
 - (3) Providing for cross ventilation by keeping the car windows partly open.
 - (4) Extending the exhaust pipe beyond the rear of the vehicle.
4. Stay away from buildings that are being fumigated.
5. The first aid measures to follow when discovering a victim of gas poisoning are to get the patient into the fresh air as quickly as possible, summon a physician, and administer artificial respiration. (Unit XXX)

UNIT XXIX

WHAT HAZARDS DO WATER AND ICE PRESENT?

Suggested Time: Two Class Periods

OBJECTIVES

- To recognize some of the swimmer's errors which may result in accidents.
- To understand some of the factors that may contribute to water and ice accidents.
- To know the correct procedure in rescuing a person who is drowning and know how to apply artificial respiration.

SUGGESTED ACTIVITIES

Recognize the Problem

Find out what safety precautions are taken at the local swimming pools or beaches.

Name several of the ways in which drownings occur to those who can and cannot swim.

Develop the Problem

Have the local lifeguard explain the qualifications he must meet to serve as lifeguard and how to rescue a person who is in distress in the water.

Learn some water games that are enjoyable and safe.

Explain the procedure of rescuing someone who has broken through the ice.

Evaluation

Make arrangements to have junior lifesaving classes taught at the pool or beach next summer.

Discuss the use of artificial respiration.

TERMS AND CONCEPTS

Artificial respiration, board, boating, branch, capsized, canoeing, currents, danger signs, designated areas, double tragedy, human chain, icehouse, ladder, life buoy, lifeguard, overrate, rocky water, rope, "rubber" ice, shallow water, skating, spring holes, swimming, tread water, undertow, water wings, weather changes.

SUGGESTED CONTENT

A. What are some of the common errors made by swimmers and boaters?

1. Swimmers often overrate their own ability by:

Swimming beyond designated areas; attempting to rescue someone who is drowning without knowing the proper methods; swimming alone; swimming when fatigued; swimming in a strong current or undertow; attempting to swim ashore from a capsized boat.

2. The following failures to observe common sense safety rules lead to many deaths:

Swimming too soon after eating; diving into shallow or rocky water; relying on water wings and inner tubes for support; swimming in unguarded places; plunging suddenly into cold water; swimming after dark; swimming under docks, piers, and rafts.

3. Careless play in or on water is dangerous.

Shoving others off docks and diving boards; pushing and holding others under water; diving or jumping on someone in the water; swimming long distance from shore instead of swimming along the shore; making and taking foolish dares; crowding and monopolizing the ladders, docks and rafts; tripping, pushing, and splashing others; playing tag along the edge of swimming pools.

4. Lack of foresight on the part of boaters may cause accidents.

Overloading a boat; going out in a leaky boat; leaving oars on shore when using an outboard motor; neglecting to tie the motor to the boat; going out too far from shore; canoeing alone; standing up or moving around in the boat or canoe; overestimating skill and strength in rowing or paddling; going out in a boat or a canoe without a life jacket when unable to swim; taking a small craft into rapid currents and high waves; failing to observe weather changes; starting for shore if the craft capsizes; failing to hold on to the capsized craft.

B. What accidents frequently occur on ice?

1. Many accidents happen in the winter during ice skating season as a result of skating before the ice is announced safe by officials; skating near spring holes and "cut ice"; going too close to "danger" signs.

2. Breaking through the ice may occur when playing on "rubber" ice; driving out on the ice; walking across the ice for a "short-cut"; building a fire in a fishing shelter on the ice; fishing through the ice.

- C. What is the approved procedure for rescuing a person in distress in the water to avoid a double tragedy?
1. Rescuing a person who is drowning requires careful thought.
 - a. Throw a rope or life buoy to the person or extend a board, paddle, or oar for the victim to grasp. Make a human chain if enough people are available.
 - b. If the first suggestion cannot be carried out, secure a boat and row out to the victim. Pull him in over the end of the boat and not over the side as the boat might tip if the latter method is employed.
 - c. **Swim out to rescue the victim as a last resort** and only if you are capable of supporting another person as well as yourself.
 - (1) Approach the victim from behind and grasp him firmly.
 - (2) Do not allow the victim to grab you.
 - (3) Hold the victim's head out of the water and tread water until assistance is obtained.
 - d. **Tow the victim to shore only if you possess sufficient skill and strength.**
 2. Rescuing a person who has broken through the ice requires careful action.
 - a. Never walk out on the ice to rescue a victim.
 - (1) Extend a rope, board, ladder or branch for the victim to grasp.
 - (2) Make a human chain if enough people are available.
 - (3) As a last resort, crawl out on your stomach to the edge of the ice and grasp the victim.
 - b. Work fast, but keep calm.
 - (1) Get help immediately if unable to extend a rope, board, ladder or branch to the victim.
 - (2) Do not endanger self.
 - D. Observe the following suggestions if you have broken through the ice and no help is available:
 1. Come up to surface and move to the edge of the ice.
 2. Stretch out arms and rest shoulders on the ice.
 3. Break away the ice until the edge is thick enough to support weight.
 4. If you are able to hoist yourself out, roll over to bring the feet up and then crawl across the ice.
 5. Remain calm and conserve strength.
 - E. What first aid should be given a person who has been rescued from a water accident? (Unit XXX)
 1. Summon a physician immediately.
 2. Give artificial respiration.
 3. Treat for shock.

SECTION NINE

FIRST AID

Suggested Time: Fifteen Class Periods

Unit XXX. What Basic Knowledge of First Aid Should Every Boy and Girl Possess? (Fifteen Class Periods)

OVERVIEW

The teaching of first aid to junior high school pupils should result primarily in accident prevention and a sense of caution in dealing with sick or injured people.

It is just as important for the first aider to know what not to do as to know what to do when an emergency arises. The course content should be modified according to the capabilities and needs of the pupils. It is best to concentrate on only a few topics in any lesson with many practical experiences provided so that true learning will take place. Misconception and haziness in the pupil's knowledge of first aid may be dangerous.

With most serious injuries it is best that the junior first aider learn to keep the victim quiet while securing the help of responsible adults, preferably medically trained people. The pupils should learn that haste is seldom advisable, usually not necessary, and often harmful. Ordinarily, junior high pupils should not attempt transportation of the seriously injured. However, a working knowledge of hemorrhage control and artificial respiration should certainly be learned because the opportunity to use this knowledge and skill presents itself at the unexpected time. Many lives have been saved by the use of these methods of life-saving.

BIBLIOGRAPHY

Pupil References (See general bibliography for addresses of publishers.)

SOURCES	PAGES
	Unit XXX
American Red Cross, First aid textbook....	Page references for each topic are listed in the content
Andress and others, The healthy home and community	224-258
Burkard and others, Health for young Americans	37-38, 43-46, 160-161, 163, 173, 204-207, 221, 224-226, 281, 326, 331-342
Burkard and others, Working together for health	229-239
Charters and others, A sound body.....	170-196
Crisp, Health for you.....	462-479
Derthick and others. Be safe and live.....	271-289
Fishbein and Irwin, Health and first aid....	131-316
Fowlkes and others, Making life healthful	365-380
Stack and others, Safety in the world of today	295-322
Wilson and others, Modern ways to health	258-284

Library References for Pupils

Note: Consult local librarian for books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References (See general bibliography for addresses of publishers.)

- American Red Cross, First aid instructor's manual (Junior course. ARC1019A. Available to qualified instructors only).
 FreeUnit XXX
- Olson, Prevention, first aid and emergencies.....Unit XXX

Sources of Free and Inexpensive Materials (See general bibliography for addresses of publishers.)

Aetna Life Insurance Company

- First aid to the injured. Free.....Unit XXX
 Manual of first aid. Free.....Unit XXX
 Poster on hand and finger injuries. Free.....Unit XXX

American Red Cross

- Ask local chapter about instructional material.
 First aid instruction charts. \$1.....Unit XXX

John Hancock Mutual Life Insurance Company

- When the unexpected happens. Free.....Unit XXX

Metropolitan Life Insurance Company

- Be ready to save a life. Free.....Unit XXX
 First aid. Free.....Unit XXX

Visual Aids (See general bibliography for addresses.)

American Red Cross

- Contact local chapter chairman for available films.
 Before the doctor comes. 3 reels. 16 mm. sound or silent.
 May be rented or purchased.....Unit XXX

Film Preview

- The following slidefilms (filmstrips) may be rented for
 30c per strip:Unit XXX
 First aid—artificial respiration
 First aid—bandaging
 First aid—control of bleeding
 First aid—transport of the injured
 First aid—wounds

National Safety Council

- Request an annotated bibliography of available films.

University of Minnesota, Bureau of Audio-Visual Instruction

- First steps in first aid. 3 reels. 16 mm. sound. 50c.....Unit XXX
 Help wanted. 3 reels. 16 mm. sound. 50c.....Unit XXX

University of Wisconsin, Bureau of Visual Instruction

- First aid: carrying the injured. 5 min. 16 mm. silent. 50c...Unit XXX
 First aid: control of bleeding. 10 min. 16 mm. silent. 75c...Unit XXX

UNIT XXX

**WHAT BASIC KNOWLEDGE OF FIRST AID
SHOULD EVERY BOY AND GIRL POSSESS?**

Suggested Time: Fifteen Class Periods

OBJECTIVES

To develop skill in specific first aid techniques.

To develop an appreciation of a basic knowledge of first aid.

SUGGESTED ACTIVITIES**Recognize the Problem**

Review common ways in which accidents occur. What is the value of having a basic knowledge of first aid?

Discuss:

Are tiny scratches dangerous?

Can a person who has a fracture of the arm move his fingers?

Why is getting a physician to the scene of the accident the most valuable help a junior high school pupil can offer?

What should be done to a dog that bites a person?

Develop the Problem

Practice tying and untying a square knot.

Show how to improvise a sterile dressing from any clean cloth by scorching.

Demonstrate and practice:

a. Application of tourniquet.

b. Application of pressure bandages.

c. Application of proper compresses and bandages to imaginary cuts on various parts of the body.

d. Loose, firm and taped bandages for the eye.

e. Arm sling.

Demonstrate and practice the use of the triangular bandage for hand or foot, chest or back, and shoulder or hip.

Demonstrate and practice:

a. Care for a drowning victim.

b. Use of newspaper, blanket and pillow for splinting purposes.

c. Care for fainting.

d. Use of a stretcher.

e. Proper transportation.

Demonstrate and practice splinting for fractures. (Do not teach traction splinting to junior high school.)

Identify and locate the six pressure points.

Demonstrate and practice:

Cravat bandaging for the head, ear, neck, arm, forearm, thigh or leg.

Practice artificial respiration.

Show how to prepare a warm solution of baking soda for use on a burn, and how to use a freshly laundered towel as a compress.

Evaluation

Divide the class into teams of four or five. Give each group a problem (an imaginary accident situation) and score each group on the quality, speed and correctness of their work in handling the problem situation. Suggested problems may be found in the Instructor's Outline, American Red Cross.

List the articles that should be found in a good first-aid kit and tell the uses of each article. Prepare individual kits for personal use at home or in the family automobile.

Examine the class for practical skill in controlling bleeding, bandaging, giving artificial respiration, and in transportation of an injured person.

TERMS AND CONCEPTS

Abrasion, aromatic spirits of ammonia, arteries, artificial respiration, bandage, bites, blisters, blood, boils, bruises, burns, chill, choking, common emergencies, compound fracture, cravat bandage, digital pressure, dislocations, dressings, drowning, electric shock, exposure, first aid, first aid kits, foreign bodies, four-tail bandage, fractures, gauze squares, gauze roller bandage, heat exhaustion, heat stroke, incised, infection, inhalation, stimulants, internal bleeding, joints, lacerated, ligaments, nausea, paleness, poisoning, pressure, pulse, punctured, respiratory system, scalds, shock, simple fracture, skeleton, skull fracture, splints, sprains, sterile, strains, stretcher, sunstroke, tendons, tourniquet, traction, transportation, triangular bandage, unconsciousness, veins, wounds.

SUGGESTED CONTENT

Note: The figures in parenthesis indicate page references in the American Red Cross First Aid Textbook (1945 edition). The authoritative material has been taken from this textbook. An asterisk (*) indicates a direct quotation.

A. Why is a knowledge of first aid valuable and how is it carried out? (1-6)

1. Definition: First aid is the immediate and temporary care given the victim of an accident or sudden illness until the services of a physician can be obtained.*

2. Purposes of first aid study.

- a. Learning what to do.
- b. Learning what not to do.

3. General Directions

- a. Keep the injured person lying down in a comfortable position, head level with body, until you know whether the injury is serious.
- b. Look for hemorrhage, stoppage of breathing, signs of poisoning, wounds, burns, fractures, and dislocations. Be sure you do not overlook some injury.
- c. Keep the injured person warm.
- d. Send for a physician or an ambulance and get victim to hospital.
- e. Keep calm and do not hurry to move the injured person unless it is absolutely necessary.
- f. Never try to give water or other liquid by mouth to an unconscious person.
- g. Keep onlookers away from the injured.
- h. Make the patient comfortable and try to keep him cheerful.
- i. Do not let the patient see his own injury.

B. What are the different types of wounds? (50-54)

1. A **wound** is a break in the skin, or in the mucous membrane lining one of the body cavities.* There are four types:
 - a. Abrasions
 - b. Incised wounds
 - c. Lacerated or torn wounds
 - d. Punctured wounds and stabs.
2. Wounds are subject to two dangers — infection and loss of blood.
3. No matter how small the wound may be, it is large enough for thousands of germs to enter and to cause infection.
4. The following care should be given to wounds in which bleeding is not severe:
 - a. Prevent more germs from entering the wound. Infection is the chief danger.
 - b. Avoid overenthusiastic attempts to clean the wound or put in an antiseptic.
 - c. Wash the wound with soap and water.
 - d. Always consult a physician.
 - e. Apply a sterile dressing or compress and bandage in place.
 - f. Do not disturb blood clots by tearing a compress from a wound.

C. What are the different kinds of bandages and dressings? (18-49)

1. A bandage is any gauze or cloth material used for any of the following purposes:
 - a. To keep dressings and splints in place.
 - b. To stop bleeding by pressure.
 - c. To serve as slings.
2. Kinds of bandages
 - a. Triangular (open and cravat)
 - b. Four-tailed
 - c. Roller
3. The wound must always be covered with a dressing before the bandage is applied. A dressing is a protective covering placed directly over a wound or infected part and must be sterile.
4. Kinds of dressings
 - a. Gauze square
 - b. Bandage compress
 - c. One-inch compress on adhesive
 - d. Folded gauze dressing
 - e. Roller or pleated bandage
 - f. Improvised dressing or compress.
5. Absorbent cotton should not be used directly over the wound or burn because it may stick and be hard to remove.

D. How does one care for wounds with severe bleeding? (54-59, 229-237)

1. The blood is a red, sticky fluid circulating through the arteries, capillaries, and veins. (Unit V) The constituents of blood are:
 - a. Fluid part, or plasma
 - b. Red cells, or red corpuscles
 - c. White cells, or white corpuscles
2. An average person has ten to twelve pints of blood. Loss of two pints at one time is serious; loss of three pints may be fatal.
3. The circulatory system is composed chiefly of the heart, arteries, and veins.
4. Blood from an artery usually comes in spurts. From a vein it usually comes in a steady flow.
5. The following care should be given to wound in which bleeding is severe:

- a. To control bleeding from a cut artery, pressure should be applied between the cut and the heart, at some point where the main artery to the injured part lies close to the bone. There are six principal points where hand or finger pressure against a bone may stop bleeding.

For the arteries to the head and neck;

- (1) In the neck at the side of the windpipe, against the backbone.
- (2) Just in front of the ear, against the skull.
- (3) About an inch forward from the angle of the jaw, where a large branch crosses the jawbone.

For the arteries to the shoulder and arm:

- (4) Behind the inner end of the collarbone, down against the first rib.
- (5) On the body side of the upper arm, halfway between the shoulder and elbow.

For the arteries to the lower limbs:

- (6) In the mid-groin as it passes over the pelvic bone.
- b. Apply a dressing as soon as available at the site of bleeding, press firmly, and release the pressure at the pressure point for a trial period.
 - c. Elevation of the injured part, if possible, will aid the control of bleeding.*
 - d. If hand pressure is difficult to maintain and the bleeding is from one of the limbs, the tourniquet may have to be applied.
 - e. Bleeding from a vein can usually be controlled by placing a compress over the wound and bandaging snugly. Then, if it is needed, apply firm pressure with the hand directly over this until a clot forms and the hemorrhage ceases.
 - f. Shock is present in all cases of serious bleeding. It should always get prompt attention as soon as the bleeding is controlled. Coffee or tea are not to be given until the bleeding has stopped.*

E. What wounds require special consideration? (61-86)

1. **Punctured wounds**, such as gunshot wounds and powder burns, are subject to special dangers and are more likely to become infected than an open wound for these reasons:
 - a. Punctured wounds usually do not bleed freely, so they fail to get the cleaning that bleeding provides.

- b. They are difficult to cleanse.
 - c. Air cannot get to the wound. Lack of air greatly favors the growth of certain germs, particularly the one causing tetanus or lockjaw.*
2. **Infected wounds** are those in which the germs that entered were not killed by the body's fighting forces or by treatment, but were able to grow in the wound and in the body tissues around it.*
- a. Symptoms
 - (1) Pain
 - (2) Swelling
 - (3) Redness
 - (4) Heat
 - (5) Pus
 - (6) Red streaks
 - (7) Swollen glands
 - b. First aid
 - (1) Always consult a physician at once.
 - (2) Apply hot packs soaked in boiled water and salt solution.
 - (3) Elevate the injured part to relieve pain.
3. A special danger from **dog bites** is the possibility of rabies infection or hydrophobia.
- a. First aid
 - (1) Always consult a physician at once.
 - (2) Wash the wound thoroughly with weak alcohol or soap and water to remove the saliva.
 - (3) For dog bites immediate application of a mild solution of iodine may be used.
 - b. Care of the animal
 - (1) Confine the animal and keep under observation for a period of two weeks. Do not destroy the dog.
 - (2) If the animal eats and acts normally, its saliva could not have been infectious at the time of the bite.
4. The following **poisonous snakes** are found in the United States:
- a. Pit vipers
 - (1) Rattlesnake (Rattlesnakes are found in southern Minnesota and have the characteristic tail-rattle.)
 - (2) Moccasin (Cottonmouth)
 - (3) Copperhead

- b. Coral snake
- c. First aid
 - (1) Secure the help of a physician.
 - (2) Apply a tourniquet between the wound and the heart.
 - (3) Cleanse the skin surrounding the wound with soap and water.
 - (4) Cut open the two fang marks with a crisscross incision one-fourth of an inch deep at each fang mark.
 - (5) Apply suction to the wound with the mouth or a suction cup.
 - (6) Treat for shock.
- 5. Wounds in which **foreign bodies remain**, such as splinters of wood and small pieces of glass, are common.
 - a. If the foreign body is near the surface of the skin, it can be picked out.
 - (1) Apply an antiseptic such as alcohol to the skin.
 - (2) Sterilize a needle or tweezers by passing it through a flame.
 - (3) Remove the splinter and then encourage a little bleeding by gentle pressure.
 - (4) Apply antiseptic and then a sterile dressing.
 - b. If the foreign body is buried deeply, always consult a physician.
- 6. In giving first aid for **foreign bodies in the eye and eye wounds**, it must be remembered that the sole purpose of the eye is to see and that only a skilled eye physician can repair damage to an injured eye and preserve its seeing function. Thus the primary objective of such first aid is to avoid doing further damage and to keep the eye intact if possible until trained professional services are available.
 - a. Bandages for the eye
 - (1) Loose bandage
 - (2) Firm bandage
 - (3) Taped bandage
- 7. **Nosebleed** often comes on spontaneously or it may follow injury.
 - a. First aid (if bleeding continues)
 - (1) Make the patient sit up, with his head held slightly back, breathing through the mouth.
 - (2) Apply cold, wet compresses over the nose.
 - (3) Pressing the nostril on the bleeding side firmly against the middle partition may stop the bleeding.

- (4) If these measures do not stop the bleeding in a few minutes, secure physician's help at once. Meanwhile, gently pack a narrow strip of sterile gauze back (not up) into the nostril. Leave the end of the gauze outside so it can be easily removed.
8. **Internal injuries** resulting from such impacts as blows on the abdomen sometimes offer a special problem because the nature and extent of the injury are not clear. Severe shock is often present.
- Follow the general directions for first aid.
 - Keep the patient lying down, treat for shock, and get a physician.
 - If it is necessary to move the patient, transport him carefully in a lying position.*

F. What is shock and how is it cared for? (7, 10-17)

- Shock is a depressed state of all body functions due to failure of the circulation.
- Shock may be caused by severe injury to the body, starvation and disease. An injury might include severe hemorrhages, burns, crushing injuries, fractures of bones; shell, bomb, and bullet wounds; injuries to chest and head.
- Any person severely injured in any of the ways already mentioned may develop shock, and treatment should be started immediately without waiting for symptoms of shock to develop. Shock is much easier to prevent than to cure.
- Factors that increase susceptibility to shock are age, malnourishment, exposure, fatigue, rough or unwise transportation, too much examination or handling, etc.
- The state of shock is very serious. Therefore, it must be treated and overcome before final treatment of the original injuries.
- The symptoms of shock vary with the nature of the injury and the individual. The following symptoms may be observed:
 - Pale face
 - Cold sweat on forehead
 - Cold and clammy hands
 - Weakness
 - Faintness
 - Dizziness
 - Nausea
 - Wide and dilated pupils
 - Vomiting
 - Shallow and rapid breathing
 - Later, irregular breathing with deep, sighing respirations.

7. The first aid measures for shock include:

- a. Conservation of body heat and keeping the patient warm. (Wrap in blankets and apply artificial heat if possible.)
- b. Keeping the patient's head low (unless he has a chest injury and noticeable difficulty in breathing).
- c. Giving fluids by mouth, if tolerated, unless the patient has an abdominal injury, nausea, vomiting or will have to have an operation.
- d. Using whiskey is without value in the first aid treatment of shock.

G. What is artificial respiration? (87-110)

1. The Schafer prone pressure method of resuscitation was introduced in the United States about 1907. In 1927, the U. S. Public Health Service and many national organizations approved this method as the standardized technique for administering artificial respiration.
2. Life depends on the energy freed when oxygen from the air combines with food in the body cells. These cells have no store of oxygen, so that the lack of it causes death to follow in a few minutes. Certain brain cells die when they have been deprived of oxygen for as short a time as four minutes.*
3. A description of the standard technique of artificial respiration follows:
 - a. Lay the patient on his abdomen, one arm extended directly overhead, the other arm bent at elbow and with the face turned outward and resting on hand or forearm, so that the nose and mouth are free for breathing.
 - b. Kneel straddling the patient's thighs. Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position, and the tips of the fingers just out of sight.
 - c. With arms held straight, swing forward slowly, so that the weight of your body is gradually brought to bear upon the patient. The shoulder should be directly over the heel of the hand at the end of the forward swing. Do not bend your elbows. This operation should take about two seconds.
 - d. Now immediately swing backward, so as to remove the pressure completely.
 - e. After two seconds, swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release, a complete respiration in four or five seconds.

- f. Continue artificial respiration without interruption until natural breathing is restored, if necessary, four hours or longer, or until a physician declares the patient is dead.
 - g. As soon as this artificial respiration has been started and while its is being continued, an assistant should loosen any tight clothing about the patient's neck, chest or waist. Keep the patient warm. Do not give any liquids whatever by mouth until the patient is fully conscious.
 - h. To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up.
 - i. Resuscitation should be carried on at the nearest possible place to where the patient received his injuries.
 - j. A brief return of natural respiration is not a certain indication for stopping the resuscitation.
 - k. In carrying out resuscitation it may be necessary to change the operator. This change must be made without losing the rhythm of respiration.
4. Artificial respiration is helpful for situations in which drowning, electric shock, gas poisoning, choking or hanging may have occurred.
5. An unconscious victim should never be removed from an electric contact until the current is definitely turned off. Too often the would-be rescuer himself becomes a victim. It is very important in all cases of rescue, as from drowning, electric wire, or gas filled room, that one should avoid taking unnecessary chances.
- H. How is first aid care for poisoning from drugs or foods given? (111-117)
1. First aid treatment for a person who has swallowed poison demands **immediate** action so that the poison can be removed from the stomach before it is absorbed. Call a physician and rush person to hospital.
 2. These are the poisonous drugs frequently taken accidentally: (Unit XXVIII)
 - a. Carbolic acid or phenol
 - b. Lysol
 - c. Bichloride of mercury
 - d. Iodine
 - e. Arsenic or Paris green
 - f. Strychnine
 - g. Strong acids
 - h. Strong alkalies
 - i. Sleep-inducing drugs
 - j. Wood alcohol

- k. Poisons such as fluorides, nicotine, arsenic and others used for spraying plants, exterminating vermin and controlling insects.
3. Preventive measures are particularly important to protect children. (Unit XXVIII)
4. There are two points to remember in the first aid treatment of poisoning:
 - a. **Dilute:** A poison diluted with a large amount of fluid is never absorbed as rapidly as in a concentrated form. Vomiting is much easier to induce if the stomach is full.
 - b. **Wash out:** Induce vomiting repeatedly until the fluid is as clear as when it was swallowed.
Soapsuds, salt water, soda water, lukewarm water, dish water, milk and baking soda will induce vomiting and dilute also.
5. Epsom salts may safely be given after the stomach is washed out.
6. Two exceptions to the procedures mentioned are acid and alkali poisons. Modern practices advise strongly against the use of emetics in these cases. This is to avoid danger of perforation. First aid for such poisoning follows:
 - a. **Acids**
 - (1) Neutralize with an alkali in solution, such as magnesia, chalk, sodium bicarbonate (baking soda), or limewater.
 - (2) Give a demulcent, such as milk, olive oil, or egg white.
 - (3) Keep the patient warm.
 - b. **Alkalies**
 - (1) Neutralize with a weak acid, such as lemon juice or vinegar.
 - (2) Keep the patient warm.
7. In all kinds of poisoning, shock should be controlled if present. Apply heat. If breathing stops, apply artificial respiration. In strychnine poisoning, do not give a stimulant, and keep the patient as quiet as possible.
8. Food poisoning is fairly common, more so in the summer months. (Unit XI)
 - a. **Causes**
 - (1) Foods improperly prepared, stored or refrigerated
 - (2) Home-canned foods improperly preserved
 - b. **Prevention**
 - (1) Personal cleanliness in preparing and serving food

- (2) Avoiding the handling of food when there is any infection of the fingers and arms.
- (3) Protect all foods from flies and insects.
- (4) Foods which are ordinarily served hot should be kept hot from the time they are prepared until served; otherwise foods should be cooled immediately and adequately refrigerated.

c. Symptoms

- (1) Uncomfortable feeling in the upper abdomen
- (2) Pain
- (3) Cramps
- (4) Nausea and vomiting
- (5) Diarrhea
- (6) More or less prostration

d. First aid

- (1) Call a physician and rush patient to the hospital.
- (2) Treatment, with some exceptions, is the same as for poisoning by drugs.
- (3) In simple food poisoning, it is probably unnecessary to give an emetic because the offending food has usually left the stomach before diarrhea or recognizable symptoms occur.
- (4) Symptoms of acute appendicitis are frequently mistaken for simple food poisoning; therefore, a cathartic should never be given to anyone suspected of having simple food poisoning unless a physician has excluded the possibility of acute appendicitis.

I. What are the general directions for proper transportation of an injured person? (176-193)

1. The importance of proper transportation for a seriously injured person cannot be over-emphasized. Improper or careless methods increase the severity of the injury and may even cause death.
2. The following general directions regarding transportation should be observed:
 - a. Necessary first aid care should be given and any tight clothing loosened before the patient is moved. Except when the face is red and the body hot the patient should be covered with a blanket during transportation.
 - b. The type of transportation to be used will depend upon the injury, the necessity for immediate removal from the scene of the accident, and the availability of transporting equipment.

- c. When the patient is in danger of losing his life or of being further injured as in the case of fire, wall collapse, or traffic, the judgment of the first aider must be used in selecting the best possible means of transportation available at the moment.
 - d. The seriously injured or ill should be transported on a stretcher or in a lying position except in those rare cases when it is necessary to prop the patient up so that he can breathe.
 - e. There is usually no great hurry if first aid has been given. It is usually best to wait for an ambulance and to move the patient only on a physician's instructions.
 - f. All fractures or suspected fractures must be handled carefully. If the patient is unconscious, fractures of the neck and back may not be recognized unless the first aider is especially careful. If there is the least doubt, treat these like broken neck cases to avoid mistakes. Many simple fractures have been converted into compound fractures by carelessness in moving a patient.
 - g. In cases of serious injury to the back of the head the patient should be laid on his side.*
- 3. The stretcher is the most satisfactory mode of transportation for general use.
 - 4. When a stretcher is not available, one of the following carries may be used depending upon the nature and extent of the injuries:
 - a. Three-man carry
 - b. Eight-man carry
 - c. Chair used as litter
 - d. Carrying patient by extremities
 - e. Two-man carry
 - f. Pack-strap carry
 - g. Walking assist
- J. How does a first aider recognize and care for fractures? (118-155)

Note: Review briefly the features of the skeleton and supporting structure which are important to an understanding of fracture first aid. (Unit IV)

- 1. A fracture is a broken bone.
 - a. Types
 - (1) Simple: the bone is broken but there is no connecting wound from the break in the bone through the skin.
 - (2) Compound: the bone is broken and there is also a wound from the break through the surface of the skin.

- b. Chief causes
 - (1) Falls
 - (2) Automobile accidents
 - c. Prevention (Unit XXIV)
 - d. Symptoms of a simple fracture—All symptoms may not be present in every fracture.
 - (1) Frequently the patient hears or feels the bone snap.
 - (2) There is pain and tenderness at the point of the break.
 - (3) The broken part may be swollen or deformed.
 - (4) The patient may feel a grating, but the first aider should never attempt to produce this grating or determine its presence.
 - (5) Many fractures can only be discovered by X-ray.
 - e. Symptoms of compound fracture.
 - (1) All the symptoms of a simple fracture may be present in a compound fracture, and also a wound that extends from the break through the surface of the skin.
 - (2) The end of the broken bone occasionally protrudes.
 - (3) Severe bleeding frequently occurs.
 - (4) Shock is likely to be severe in such cases.
2. General first aid treatment of simple fractures:
- a. Call a physician.
 - b. Before the physician arrives, first aid treatment is applied.
 - (1) To prevent further damage, avoid handling the injured part. Do not move the injured person until some sort of splint or fixation is applied to immobilize the fractured bone ends.
 - (2) To control any shock that may be present and prevent more from developing. This is done by keeping the patient in a comfortable lying position and keeping him comfortably warm.*
3. General first aid treatment of compound fractures:
- a. Call a physician.
 - b. Control serious bleeding by holding compresses firmly over the wound or by applying a tourniquet if necessary.
 - c. Apply a sterile dressing to the wound and bind firmly in place.

Note: Traction splinting is not taught to junior high school pupils.

4. The symptoms and first aid treatment for each of the following fractures differ:

Nose	Skull	Leg
Lower jaw	Forearm	Foot
Collarbone	Wrist	Toe
Ribs	Hand	Spine
Upper arm	Finger	Back
Elbow	Thigh	Pelvis
	Kneecap	

(In back and pelvis fractures, attempts at transportation should not be made by junior high school pupils.)

- K. How should dislocations, sprains, strains and bruises be cared for? (155-161)

1. When a bone gets out of place at a joint, the condition is called a **dislocation**.

a. Except in certain emergencies, no one except a physician should reduce a dislocation because of the danger of further injury to the blood vessels, nerves, ligaments, membranes, and muscles around the joint.

b. Dislocations of the shoulder and fingers are the most common, and dislocations of the jaw, elbow, kneecap, and hip may also occur.

c. **Symptoms**

- (1) Pain
- (2) Deformity
- (3) Swelling
- (4) Usually a complete loss of normal movement
- (5) Severe shock may be present

d. **General first aid**

- (1) Make injured part as comfortable as possible
- (2) Apply cold compresses
- (3) Treat shock if it is present
- (4) Support the injured part during transportation

2. **Sprains** are also injuries to joints. Sprains are partial or complete tears of some of the supporting ligaments of a joint caused by forced movement beyond its normal range.*

a. **Symptoms**

- (1) Pain
- (2) Swelling
- (3) Discoloration

b. Many apparent sprains of ankle, wrist, or fingers are really fractures, which can only be determined by X-ray.

c. **General first aid**

- (1) Elevate the part

- (2) Apply cold applications
 - (3) Refrain from using the part until a physician examines it
3. A **strain** is an injury to a muscle or tendon as a result of severe exertion.
- a. Chief causes
 - (1) Lifting from an improper position
 - (2) Lifting too great a load
 - (3) Sudden twisting and wrenching
 - b. Symptoms
 - (1) Pain at time of injury
 - (2) Stiffness and painful movement of the part
 - c. General first aid
 - (1) Rest of the injured muscle
 - (2) Heat
 - (3) Rub **upward** on the part because this aids the return flow of blood in the veins.
4. A **bruise** is caused by a blow to some part of the body which breaks the small blood vessels in the tissues just under the skin.
- a. Symptoms
 - (1) Pain
 - (2) Swelling
 - (3) Discoloration
 - b. General first aid
 - (1) Usually no first aid is needed.
 - (2) If first aid is applied immediately, ice or cloths wrung out of very cold water help.
 - (3) If the skin is broken, the treatment is the same as for any open wound.
- L. What is the nature of the first aid treatment for injuries due to heat and cold? (162-175)
- 1. Injuries caused by heat contact are **burns**. A burn caused by a hot liquid, or a hot moist vapor is called a **scald**.
 - 2. Burns are classified according to degree, that is, the depth to which the body tissues are injured.
 - a. First degree—Skin reddened
 - b. Second degree—Skin blistered
 - c. Third degree—Deeper destruction of tissue, as charring or cooking.*

3. Burns and scalds cause the death of more children than does any other kind of accident. Most of these deaths could be prevented by observing certain safety rules. (Unit XXV)
4. Speed and clear thinking are essential when escaping from a burning building. (Unit XXV)
5. General first aid for burns consists of relieving pain, preventing infection and treating shock.
 - a. The treatment of first degree burns consists of the application of any good burn ointment, vaseline, soda in water, or any clean oily substance and covering with clean gauze or cloth. Cold water cools the part and relieves the pain, especially if it is applied immediately.
 - b. In second and third degree burns, the skin is broken so the danger of infection is present.
 - (1) Never use an oily or greasy substance that might transfer germs into the wound.
 - (2) Cut away all loose clothing from the burn. Leave any part that sticks to the skin for the doctor to remove.
 - (3) Apply picric acid gauze or sterile gauze soaked in a baking soda or Epsom salts solution to the burn.
 - (4) Treat for shock if necessary.
6. **Severe sunburn** is dangerous.
 - a. Prevention is important.
 - b. General first aid
 - (1) Calamine lotion
 - (2) Olive oil and cocoa butter
 - (3) Wet dressing of Epsom salts solution
 - (4) Consult a doctor if burn is severe.
7. **Chemical burns** caused by an acid or alkali should be washed immediately with large quantities of water; apply an ointment dressing after the chemical is washed off, and get a physician.
8. Any **chemical burn of the eye**, caused by lime, cement, and "battery fluid," or some similar material should be washed out immediately with large quantities of water. Then put several drops of clean olive oil, mineral or castor oil into the eye. Cover with a sterile compress and get a physician immediately.
9. Exposure to excessive heat usually results in one of three definite conditions: **sunstroke** (heat stroke), **heat exhaustion**, or **heat cramps**.*

a. Prevention

- (1) Drink an abundance of water.
- (2) Add salt in unusual amounts to food and drink.
- (3) Wear loose, thin clothing.
- (4) Eat light, easily digestible food in moderate amounts.
- (5) Cut down on muscular exertion during the hottest periods of the day.
- (6) Avoid exposure to the direct rays of the sun.

b. This chart will help to distinguish between sunstroke and heat exhaustion:

SUNSTROKE and HEAT STROKE	HEAT EXHAUSTION
Cause: Exposure to heat, particularly the sun's rays.	Cause: Exposure to heat, either sun's rays or indoor.
Symptoms: Headache, dizziness, red face, hot and dry skin, no sweating, strong and rapid pulse, very high temperature, usually unconscious.	Symptoms: Pale, moist and cool skin, profuse sweating, weak pulse, nausea, low temperature, often faint but seldom remain unconscious.
Treatment: Cool body with bath or cold applications, elevate patient's head, no stimulants. Get victim to a hospital and call a physician.	Treatment: Place victim with head level or low, patient often requires external heat, give stimulants, give salt. Get victim to a hospital and call a physician.

c. First aid for heat cramps is the same as for heat exhaustion.

10. **Frostbite** is the injury produced by the freezing of a part of the body. The body areas most frequently frosted are the nose, cheeks, ears, toes, and fingers.

a. Prevention is important.

b. Symptoms

- (1) Frosted area becomes bluish white because of the ice actually frozen in the tissues.
- (2) Usually there is considerable pain if the hands or feet are frosted.
- (3) Often frosted cheeks, ears or nose are not painful.

c. General first aid

- (1) Warm the part gradually.
- (2) Give the victim a warm drink.
- (3) Massage the area near the damaged tissue; if a limb is frozen, massage starting near the trunk, but do not rub the badly frozen tissue itself.
- (4) Never rub the frozen area with or without snow.

11. When a person is exposed to **severe cold for a prolonged period**, he becomes numb, movement is difficult, and irresistible drowsiness overtakes him.*

a. Symptoms

- (1) Staggering
- (2) Failing of eyesight
- (3) Falling and becoming unconscious

b. General first aid

- (1) Place victim in a cool room.
- (2) If breathing has stopped, apply artificial respiration.
- (3) Rub the limbs briskly with cloths wet in cool water.
- (4) Raise temperature of room slowly when patient begins to react and give him a hot drink of tea, coffee or cocoa.
- (5) Put patient in a warm bed.

M. What are the causes of unconsciousness? (194-203)

1. Unconsciousness may be either complete or partial. If complete, there is no response from the patient. If partial, there may be mumbling or incoherent replies. The same causes may produce either state, and it is not uncommon for a patient to pass from one state to another.*
2. Certain cases of unconsciousness are easily confused, such as: apoplexy, skull fracture, drunkenness, diabetes. If there is any doubt at all, always treat for skull fracture or apoplexy.
3. If the cause of unconsciousness is unknown, classify the case as follows:
 - a. Unconsciousness in which patient has a flushed face.
 - b. Unconsciousness in which patient has a pale face.
4. Secure medical advice for all cases of unconsciousness. The important first aid lies simply in keeping the patient quiet, avoiding handling, transportation, and measures designed to arouse him.
5. Common causes of unconsciousness are:
 - a. Apoplexy
 - b. Alcoholism
 - c. Fainting
 - d. Heart failure
 - e. Epileptic convulsions or fits
 - f. Diabetes

6. Causes of unconsciousness already mentioned are:
 - a. Concussion
 - b. Shock
 - c. Hemorrhage
 - d. Sunstroke
 - e. Heat exhaustion
 - f. Prolonged exposure to cold
 - g. Poisonous drugs
 - h. Apoplexy
 - i. Diabetes
- N. What are some of the common everyday first aid problems? (203-219)
 1. Blisters
 2. Boils
 3. Colds
 4. Corns
 5. Earache
 6. Hiccups
 7. Hives
 8. Foreign bodies
 - a. In ear
 - b. In nose
 - c. In trachea
 - d. In esophagus
 9. Insect bites
 10. Pain in the abdomen
 11. Poison ivy and sumac
 12. Sties
 13. Toothache
- O. What are the recommended contents for first aid kits? (242-246)
 1. The unit type kits have a complete assortment of first aid materials put up in standard packages of unit size or multiples of the unit size, and arranged in cases of 16, 24 or 32 units.
 2. The other type of kit and one which is most commonly found in drug stores is one in which there is no uniformity of size or type of package. These kits are satisfactory if the following points are observed in their selection:
 - a. The kit must be large enough and have the proper contents for the place where it is to be used.

- b. The contents must be arranged so that the desired package can be found quickly without unpacking the entire contents.
- c. Material must be wrapped so that unused material does not become dirty through handling.*

3. A good first aid kit contains these articles:

Sterile gauze squares—about 3" x 3" in individual packages
Assorted sterile bandage compresses in individual packages
Triangular bandages
Sterile gauze
Roll of adhesive tape
Burn ointment
Aromatic spirits of ammonia
Tourniquet
Scissors
Tweezers
Bicarbonate of soda
Calamine lotion
Hot-water bag
Epsom salts
Ice bag
Absorbent cotton
Medicine dropper
Safety pins
Oil of clove
Splints
Sterile castor oil or mineral oil for use in eyes

4. Every automobile should carry the following minimum articles for first aid:

1-inch compresses on adhesive
3-inch bandage compresses
Sterile gauze
Triangular bandage
Burn ointment
Scissors
Tourniquet

5. In addition to the articles already suggested, it is desirable to place splints and sufficient bandages for applying splints in automobiles and homes. Each automobile, for example, should have splints of various sizes, bandages, flashlight, jackknife, and a blanket to use in caring for a major injury.

SECTION TEN

DRIVER EDUCATION

Suggested Time: Thirty Class Periods

- Unit XXXI. What Are the Causes and Effects of Traffic Accidents ' (Four Class Periods)
- Unit XXXII. What Are the Physical, Mental and Emotional Qualifications, Attitudes and Responsibilities of an Efficient Driver? (Five Class Periods)
- Unit XXXIII. What Basic Principles of Automobile Construction, Maintenance, and Operation Should Every Driver Understand? (Five Class Periods)
- Unit XXXIV. What Are the Principles of Learning to Drive, the Driving Procedures and the Habits One Must Attain to Become a Skillful Driver? (Six Class Periods)
- Unit XXXV. What Rules and Regulations and Highway Improvements Have Been Made to Make Driving as Safe as Possible? (Five Class Periods)
- Unit XXXVI. How Can Drivers, Pedestrians, and Bicyclists Cooperate to Reduce the Accident Toll? (Five Class Periods)

OVERVIEW

Scientists are continually providing more efficient and speedier automobiles for the use of the drivers of today. The traffic accident records show that forty thousand people are killed and over a million additional people are painfully injured each year because the driver does not know how to use this new power intelligently. The high accident record can be reduced if society will learn and obey the laws regulating traffic, gain skillful manipulation in the use of an automobile, develop an appreciation of pedestrian rights, exercise good judgment and control as a motorist, develop proper attitudes toward the other motorist, recognize the hazards that exist in driving and appreciate the responsibilities involved in being a driver.

Very alarming is the trend toward more and more accidents involving younger drivers, especially those under twenty years of age. Junior high school pupils who are approaching or have reached fifteen years of age, the age at which they may be licensed to drive motor vehicles in Minnesota, are the drivers of tomorrow. It is for them, especially, that this section has been written. The most hopeful view of the traffic accident problem is that these boys and girls will be safer and more skillful drivers than the average driver of today.

Throughout the traffic safety units, statistics for 1941 have been used because they present a more typical picture of the traffic problem than do the figures for the years of World War II.

The units in this section are based on the content of "Lessons in Traffic Safety," a basic pupil text that is available to the schools without cost in quantity lots from the Minnesota Department of Education or the Minnesota Department of Highways.

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Stack and others, Safety in the world of today.....	35-40	325	341-349	335-341	55-61 349-354	41-55

Library References for Pupils

Fuller, Curtis, The motor car in American life.

Note: Consult local librarian for additional books and magazines suitable for supplementary reading by junior high school pupils.

Teacher References (See general bibliography for addresses of publishers)

Fitzgerald and others, Drive and live.....Units XXXI-XXXVI
 Marble and Wilson, Automobile safety.....Units XXXI-XXXVI
 Minnesota Automobile Association, Sportsmanlike
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 Whitney, Man and the motor car.....Units XXXI-XXXVI

Sources of Free and Inexpensive Materials (See general bibliography for addresses of publishers.)

Aetna Life Insurance Company

Publishes free material on automobile accident preventionUnit XXXI

American Automobile Association

Does extensive work in field of highway accident prevention. Issues posters, standard achievement tests, blueprints for installing dual control in driver-training cars and for constructing driver testing and demonstration devices.....Units XXXI-XXXIV

American Road Builders' Association

A visit by the spirit of safety. Pamphlet which contains two plays for elementary and junior high school. Free.....Unit XXXI

Automobile Manufacturers Association

Automobile facts and figures. Free.....Unit XXXI

Bicycle Institute of America

Bicycle safety bulletins. Free.....Unit XXXVI

Poster "Points for Pedalers." Free.....Unit XXXVI

Cycle Trades of America, Inc.

Bicycle for health and pleasure. Free.....Unit XXXVI

Safety posters. Free.....Unit XXXVI

General Electric Company

Issues booklets, pamphlets, and reprints on highway lighting, which are available free for limited distribution.....Unit XXXV

General Motors Corporation

Putting progress through its paces. Free.....Unit XXXIII

We drivers. Free.....Units XXXI-XXXIV

When the wheels revolve. Free.....Unit XXXIII

Request a list of new publications.

John Hancock Mutual Life Insurance Company

Picture yourself as the safe driver. Free.....Units XXXI-XXXVI

Lumbermen's Mutual Casualty Company

Drivers' handbook. Free.....Units XXXI-XXXVI

Issues bulletins and posters on automobile safety. Free.

Metropolitan Life Insurance Company

Calling all drivers. Free.....Units XXXI-XXXVI

Minnesota State Department of Education or**Minnesota Department of Highways**

Behind the wheel. Free.....Units XXXIII-XXXIV

Lessons in traffic safety. Free.....Units XXXI-XXXVI

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National Conservation Bureau

Complete list of publications free upon request..Units XXXI-XXXVI

Driver testing devices.....Unit XXXII

National Safety Council

Accident facts (current edition), 50c.....Unit XXXI

Complete list of publications free upon request

National Women's Christian Temperance Union

- Alcohol and automobile accidents, 2c each.....Units XXXI-XXXII
 Safety on the highroad, 2c each.....Units XXXI-XXXII
 Why drink dulls the driver, 2c each.....Units XXXI-XXXII

Travelers Insurance Company

- Issues an annual publication containing charts and statistics dealing with automobile accidents. Publishes "The Travelers Quiz," containing multiple-choice question groups based on accident facts and causes. Issues "Highway Hazards," a monthly publication containing safety articles and tests, released during the school term. Materials available free upon request.....Unit XXXI

Visual Aids (See general bibliography for addresses.)

Aetna Life Insurance Company

- Points for pedalers, 11 min. 16 mm. sound.
 Free.....Unit XXXVI
 Saving seconds, 2 reels. 16 mm. and 35 mm.
 silent or sound. Free.....Unit XXXI

American Automobile Association

- Needless hurry, endless worry, 1 reel. 16 mm.
 silent or sound. Free.....Unit XXXVI

Chevrolet Motor Company

- Turnabout man, 1 reel. 16 mm. sound. Free....Unit XXXII

Chrysler Corporation

- A plea for safe driving, 1 reel. 16 mm. silent
 or sound. Free.....Unit XXXI

Cycle Trades of America

- Bicycling with complete safety, 1 reel. 16 mm.
 sound. Free.....Unit XXXVI

Employees Mutual Accident Prevention Department

- Handlebar hazards, 1 reel. 16 mm. silent. Free..Unit XXXVI

Film Preview

- Nightdriving, 35 mm. slidefilm (filmstrip). 30c..Unit XXXIV
 Safety on the highway, lantern slides (20 plain
 and 10 colored). \$1.....Units XXXI, XXXIV
 Safety on two wheels, 35 mm. slidefilm (film-
 strip). 30c.....Unit XXXVI

Minnesota Department of Education

Traffic jam ahead, 35 mm. filmstrip with record. Free.....Unit XXXII

University of Minnesota, Bureau of Audio-Visual Instruction

Guilty, 3 reels. 16 mm. sound. \$2.50.....Unit XXXI

Hit and run driver, 2 reels. 16 mm. sound. \$2..Unit XXXI

Man at the wheel, 431 feet. 16 mm. sound. \$1.25..Units XXXI-XXXV

Safety on the highway, 174 feet. 16 mm. sound.

50c.....Unit XXXI

We drivers, 1 reel. 16 mm. sound. 25c.....Units XXXIV, XXXV

University of Wisconsin, Bureau of Visual Instruction

Speaking of safety, 15 min. 16 mm. silent. 50c..Units XXXI

Spinning spokes, 15 min. 16 mm. silent. 75c....Unit XXXV

Street safety: Advanced grades, 15 min. 16

mm. silent. 75c.....Unit XXXVI

UNIT XXXI**WHAT ARE THE CAUSES AND EFFECTS OF
TRAFFIC ACCIDENTS?**

Suggested Time: Four Class Periods

OBJECTIVES

- To develop the understanding that most automobile accidents are avoidable.
- To develop an appreciation of the significance and scope of the automobile accident toll.

SUGGESTED ACTIVITIES**Recognize the Problem**

Secure up-to-date statistics and develop a graph to show the accident rate according to age groups. Suggest things that pupils of high school age can do to help cut down the high accident rate in their age groups.

Discuss: Have you ever seen or been in an automobile accident? Describe the results. What were the causes of the accident? What could have been done to prevent it?

Develop the Program

Visit a traffic court to witness a case being tried. Report your observations to the class.

Post pictures of automobile accidents and note the causes of the various accidents.

Discuss in detail what should be done at the scene of an accident.

Evaluation

Make spot maps of accidents occurring in the community. Discuss the ways in which the accidents could have been avoided.

Discuss the significance of the local, state and national traffic accident toll in deaths, injuries and economic loss.

TERMS AND CONCEPTS

Accident report, collision, defective vehicles, fatal accidents, financial responsibility laws, illegal action, insurance, liability insurance, Minnesota Safety Responsibility Act, negligence, nonfatal accidents, pedestrians, reckless, road conditions, speed, types of accidents, violations, weather conditions.

SUGGESTED CONTENT

- A. What are the 1941 (prewar) figures on motor vehicle accidents?
 1. The automobile in 1941 shattered every accident record since the motor car became a factor in modern transportation. The columns of figures, totaling forty thousand dead and almost a million and a half injured, stand as gruesome monuments to America's carelessness.
 2. The following figures are sometimes useful in the interpretation of vehicle accident statistics in the United States (Accident Facts, 1942):
 - a. Motor vehicle registrations (Dec. 31, 1941) — 34,355,000, nearly three-fourths of the world's motor vehicle registrations.
 - b. There is 1 automobile for every 4 persons compared with the prewar ratio of 1 for each 140 persons throughout the rest of the world.
 - c. Approximate number of drivers (1941) — 44,000,000. About 1 in 4 are women.
 - d. Total motor vehicle mileage traveled (1941) — about 317,000,000,000 miles.
 - e. Total road and street mileage (1941) — approximately 3,200,000 miles.
 3. The following is a table showing the types of motor vehicle deaths and injuries for 1941:

Types of Motor Vehicle Deaths and Injuries, 1941

Type of Accident	Number	Deaths			Number	Nonfatal Injuries		
		Total	Urban	Rural		Total	Urban	Rural
Total Persons	40,000	100	100	100	1,400,000	100	100	100
Collision with—								
pedestrian	13,600	34	58	20	265,000	19	32	4
other motor vehicle	12,500	31	17	39	830,000	59	52	67
railroad train.....	1,840	5	6	4	5,000	*	*	*
street car.....	110	*	1	*	12,000	1	2	*
bicycle	900	2	4	1	37,000	3	5	1
animal, animal-								
driven vehicle.....	250	1	*	1	10,000	1	*	1
fixed object.....	1,350	3	3	4	31,000	2	2	3
Noncollision	9,450	24	11	31	210,000	15	7	24

*Less than half of 1 per cent.

(Accident Facts, 1942. National Safety Council estimates based on reports of city and state traffic authorities.)

B. What actions of drivers result in accidents?

1. Often a combination of factors may be present as the cause of an accident. For example: A speeding car with poor brakes may hit a pedestrian who is jaywalking.

2. When the statistician analyzes the factors involved in a million accidents, the fact stands out crystal clear that drivers usually have no one but themselves to blame for accidents.
3. Of the 40,000 persons killed in accidents in 1941, 27,000 or 2 out of 3 died because of some reckless or illegal action on the part of a driver.
4. Following is a table listing the actions of drivers that resulted in deaths and injuries in 1941:

Driver Violations, Motor Vehicle Traffic Accidents, 1941

VIOLATION	In Fatal Accidents (Average Per Cent) (28 States)	In All Accidents (Average Per Cent) (27 States)
Exceeding speed limit.....	14	6
Exceeded safe speed—no stated limit.....	5	3
Exceeded safe speed—no stated limit existing.....	5	2
Did not have right-of-way.....	6	10
Following too closely.....	1	2
Improper passing.....	4	4
On wrong side of road.....	10	7
Failed to signal or improper signal.....	1	2
Improper turning.....	1	3
Disregarded signal, officer.....	1	1
Disregarded stop sign.....	2	2
Disregarded warning sign.....	2	1
Improper parking, starting.....	1	2
Other improper driving.....	11	8

(Accident Facts, 1942. National Safety Council estimates based on reports of city and state traffic authorities.)

5. Exceeding the speed limit again leads the list of violations of drivers in accidents. As with other causes of traffic accidents, no one can say exactly how many accidents are attributable to high speeds. There may be multiple causes of a single accident and also problems of estimating speeds and judging whether they were in excess of speed limits, or the safe speeds for conditions prevailing.

C. What other factors are present when accidents occur?

1. In 1941 more than 90 per cent of all vehicles involved in fatal and nonfatal accidents were apparently in good condition when the crash occurred according to the following statistics:

Motor Vehicle Condition, Traffic Accidents, 1941

Condition of Vehicle	In Fatal Accidents (33 States) Average Per Cent	In All Accidents (33 States) Average Per Cent
All Vehicles Involved.....	100	100
Defective brakes	2	1
Improper lights.....	1	1
Steering mechanism defective..	*	*
Blowout or defective tires.....	2	1
Other defects.....	1	1
No defects.....	94	96

*Less than half of 1 per cent.

(Accident Facts, 1942. National Safety Council estimates based on reports of state traffic authorities.)

2. More persons are killed in traffic accidents on Saturday and Sunday than on any other days of the week. Tuesday has the lowest record. 6:00 to 8:00 o'clock in the evening are the peak hours for fatal accidents, with 16 per cent of the day's total. The fatal accident rate per mile of travel climbs rapidly after dusk. Almost 60 per cent of all traffic fatalities occur at night, when only one-third of the driving is done. The travel death rate at night is, then, approximately three times the day rate. (Accident Facts, 1942)
3. The tables showing the kind of weather and road conditions prevailing when accidents occur change little from year to year. Invariably they prove that the vast majority of accidents happen in the clear weather and on dry roads. They make it quite evident that man's recklessness, rather than nature's capriciousness, is largely responsible for the tragic record of highway deaths and injuries.

Weather and Road Surface Conditions Prevailing in Accidents, 1941

Conditions Prevailing	In Fatal Accidents (34 States) Per Cent	In All Accidents (34 States) Per Cent
Weather		
Total Accidents	100	100
Clear	78	76
Cloudy	9	9
Rainy	9	10
Snowy	2	3
Fog	2	2
Other	*	*
Road Surface Condition		
Total Accidents	100	100
Dry	82	77
Wet, Muddy.....	14	16
Snowy, Icy.....	4	7

*Less than half of 1 per cent.

(Accident Facts, 1942. National Safety Council estimates based on state and city traffic authorities.)

4. Very alarming is the trend toward more and more accidents involving younger drivers, especially those under 20 years of age. The American Automobile Association in a special study of 7 states found that the fatal accident rate on a mileage basis for drivers under 20 was 89 per cent higher than the all-age rate. For all accidents, the under 20 rate was 75 per cent higher than the all-age rate.

D. What should be done when an accident occurs?

1. If one comes upon the scene of an accident or is involved in an accident himself, there are specific common-sense procedures that should be followed.
 - a. If possible, drive your car off the road in order to eliminate a hazard on the highway.
 - b. Keep cool and try to calm the injured persons.
 - c. See that the proper precautions are taken to prevent other cars from crashing into the damaged ones. At night accidents flares could be set up if they are available or watchers could be posted to warn other motorists.

- d. Protect or help the injured persons so that no further injury will occur. Every driver should have a basic knowledge of first aid to be prepared for just such an emergency. To be able to stop serious bleeding or to revive a carbon monoxide victim are only two examples of how a life could be saved.

Be cautious to apply first aid only to the extent that you know you are acting properly. **Never move an injured person.** (Unit XXX)

Note: Consult the Red Cross Manual on First Aid for detailed information on this subject.

- e. Summon the local police, the sheriff, or a highway patrol officer reporting the accident and requesting medical aid and an ambulance if that seems necessary.
 - f. Secure the names and addresses of all available witnesses.
 - g. List the names, addresses and a general description of every person involved in the accident. State nature of injury for each injured person.
 - h. Check the operators of the cars involved for driver licenses and then double check the description on the license to see if the description fits.
 - i. Secure the make, type and registration of all the vehicles involved in the accident.
 - j. Obtain the name and address of the owner of the vehicle if the present operator does not own it. Write down all license numbers.
 - k. Note the time of the accident, the weather and the condition of the road. Describe the events leading up to the accident and the condition, the speed and position of all vehicles in the accident. Observe the damage sustained. Recording all this information may prove valuable if involved in a lawsuit.
- 2. The legal requirements relative to the reporting of accidents differ from state to state. It is advisable to get complete and accurate information about the financial responsibility law in the state in which one is traveling if involved in an accident.
 - 3. Minnesota has a Safety Responsibility Act which, in brief, requires payment of damages to any person who may be injured or may have suffered property damage as a result of a motor vehicle accident. Following is a condensation of this act:

- a. Each driver of a motor vehicle involved in an accident in which any person was killed or injured, or where there has been \$50.00 or more total property damage, must report the accident to the Commissioner of Highways within 24 hours. The drivers license of each driver and owner involved in such an accident must be suspended by the Commissioner of Highways unless:
 - (1) There is filed with the Commissioner of Highways a Notice of Policy from an insurance company showing that there was in force at the time of the accident a motor vehicle liability policy covering the driver or owner; or
 - (2) There has been filed with the Commissioner of Highways a release on all damages arising out of such accident by all persons damaged or injured; or
 - (3) A deposit in cash or negotiable securities has been made with the Commissioner of Highways in an amount up to \$11,000 as may be determined by the Commissioner of Highways as being sufficient to satisfy any judgments which might be obtained against the driver or owner arising out of the accident.
- b. If any person fails to satisfy any civil judgment obtained against him arising out of an automobile accident, the Commissioner of Highways must suspend such person's drivers license until the judgment has been satisfied and proof of financial responsibility for future accidents is filed with the Commissioner.

UNIT XXXII

WHAT ARE THE PHYSICAL, MENTAL AND EMOTIONAL QUALIFICATIONS, ATTITUDES AND RESPONSIBILITIES OF AN EFFICIENT DRIVER?

Suggested Time: Five Class Periods

OBJECTIVES

- To develop an understanding of the qualifications, attitudes and responsibilities of a skillful driver.
- To realize that "driving is a privilege granted by society to persons who prove themselves worthy."
- To develop an appreciation of tolerance, courtesy and sportsmanship as assets to the skillful driver.

SUGGESTED ACTIVITIES

Recognize the Problem

- Discuss: Do you know a driver who is qualified in every way to drive a car? If so, list his qualities.
- Discuss: How many feet would a driver travel after a warning of danger before he began to stop the car if traveling thirty miles per hour? Sixty miles per hour?

Develop the Problem

- Define reaction time. Illustrate.
- Discuss the defects of vision and their affect on driving ability.
- Make a list of attitudes which will help a driver to master his job of driving safely.
- Discuss the value of good coordination of seeing, thinking and doing when driving a car.
- Give the characteristics of drivers who are physically, mentally or emotionally unqualified to drive.

Evaluation

- Investigate what is being done in the state of Minnesota to prohibit physically and mentally deficient persons from driving. Compare with practices in other states.
- Conduct simple tests for vision: field of vision, distance judgment and glare recovery. (National Conservation Bureau, Driver Testing Devices.) The Snellen test and the yarn color test may be substituted if other equipment is not available. (Unit I)

TERMS AND CONCEPTS

Alcohol, alertness, attention, attitude, braking distance, carbon monoxide, chronic diseases, color vision, courteous, "dawdler," disabled drivers, driver's license, drowsiness, emotions, fatigue, intelligence, judgment, mental qualifications, narcotics, night vision, physical qualifications, reaction time, "road hog," side vision, speed maniac, sportsmanlike, temperamental driver, temporary disabilities.

SUGGESTED CONTENT

A. What physical conditions may affect the efficiency of the driver?

1. General Physical Fitness

General physical fitness fosters clear thinking, fast reaction time and resistance to fatigue.

2. Vision (Units I, II and XII)

a. A person having less than normal vision in either eye should not attempt to drive unless the defect is corrected by whatever method the doctor prescribes. A driver should have clear and correct vision.

b. Several of the visual defects which drivers are especially concerned with are:

(1) Myopia or nearsightedness—The inability to see distant objects clearly.

(2) Tunnel or "barrel" vision—The inability to see out of the corners of the eyes.

(3) Night blindness—The inability to see at night.

(4) Double vision—Seeing two of every object when there is only one.

(5) Color blindness—The inability to distinguish colors.

All of these must be compensated for, if present, to permit safe driving.

3. Hearing

A driver with poor hearing must rely more on his vision because he will not hear the sirens of emergency vehicles, the horns of motorists who wish to pass or any strange or unusual noise in the automobile. He must execute all his movements with special caution and thus compensate to some degree for the deficiency.

4. Reaction Time

Reaction time for the automobile driver is the period during which he perceives danger and responds to it. A normal reaction time to make a decision is about one-half to three-

quarters of a second. Reaction time is closely related to braking distance because a car will travel many feet after the driver senses a need to stop and before he actually applies the brakes. The time that elapses may mean the difference between life and death. The following table shows the relationship between speed of the automobile and reaction, braking and stopping distances:

**TABLE OF REACTION, BRAKING AND STOPPING DISTANCES
IN RELATIONSHIP TO SPEED**

Miles Per Hour	Feet per Second	Reaction Distance	Braking Distance	Total Stopping Distance
10	14.7	9.8	7	16.8
15	22	14.7	15	29.7
20	29.3	18.5	28	46.5
25	36.7	24.5	43	67.5
30	44	29.3	62	91.3
35	51.3	34.2	84	118.2
40	58.7	40.3	109	149.3
45	66	44	135	179
50	73.4	49	172	221
55	80.7	53.8	210	263.8
60	88	58.7	248	306.7

5. Proper Height

The adjustable type of driver's seat has overcome many problems relative to differences in stature. The extremely tall person still has to crouch over the steering wheel and consequently cannot see as well as the person of average height. This stooped position produces fatigue more quickly. The short driver usually can overcome his handicap by the use of a cushion and proper adjustment of the seat.

6. Age

Body processes are slowed down, strength and endurance are reduced, and the senses may become dulled as age increases. The courteous driver will be cognizant of this fact and will respect elderly drivers and pedestrians.

7. Fatigue

a. Many lives are lost annually because persons insist upon trying to drive when they are fatigued. They either fall asleep at the wheel and drive off the road or gain a false impression of their capabilities by being in a state of nervous tension. This latter condition results in the misjudging of distances, speed and road hazards. Reaction time is lengthened because the driver is less alert.

- b. Drowsiness or fatigue may be caused by a lack of proper rest or sleep preceding the driving period, by ill health, by overeating, by general body weakness, by carbon monoxide, by eye strain, by hot or humid weather, by sitting too long in one position, by poor ventilation, by listening to the monotonous sound of the motor for a long period of time, etc.
- c. If a driver is fatigued, the most sensible thing for him to do is park the car in a safe position off the road and go to sleep or rest. It is also advisable to allow another driver to take over if there is a competent one in the vehicle.

8. Chronic Diseases and Temporary Illness

A person suffering from a chronic disease, such as heart disease, epilepsy, high blood pressure or extreme nervousness, should never drive because of the danger of sudden collapse and resultant loss of control of the automobile. A driver must use special precaution if necessary to drive when suffering from a temporary illness.

9. Disabled Drivers

Many people who have lost a limb or who are crippled have compensated for their disabilities by having their cars equipped with special controls and by observing safe driving practices. A physically disabled person should develop better than average skill and confidence before attempting to drive in traffic.

10. Alcoholism (Unit XVI)

- a. The drunken driver is becoming an increasing cause of accidents and deaths. He must be kept off the road for the protection of other motorists and pedestrians. Doctors have stated that the drinking of beverages with alcoholic content may affect the average person so as to reduce visual acuity, ability to reason and muscular efficiency. The use of alcohol reduces the ability to recognize danger and lengthens the reaction time.
- b. The high speed that automobiles may attain and the seriousness of accidents which so often result in death and severe injury make it necessary that the driver at all times have full control and complete coordination of his muscles and reasoning powers, and that his judgment at no time be distorted or affected by alcohol.

It is unlawful for a person who is under the influence of intoxicating liquor to drive a motor vehicle. In addition to a fine or imprisonment that the court may impose, the driver's license of any person convicted of drunken driving is automatically revoked.¹

¹Minnesota Statutes, 1945, Sections 169.12 and 171.17.

11. Narcotics (Unit XVI)

Narcotic drugs, such as cocaine, opium, marijuana and heroin, are habit-forming and detrimental to the health of the user. These drugs should be avoided by anyone driving a motor vehicle because they affect the brain directly and cause a loss of reasoning power and judgment.

Any person convicted of the charge of driving a motor vehicle while he is an habitual user of narcotic drugs, or while he is under the influence of narcotic drugs, may be punished in the same manner and in the same degree as a person convicted of the charge of drunken driving; and his driver's license is automatically revoked.¹

12. Carbon Monoxide Poisoning

- a. Carbon monoxide is a colorless, odorless, and tasteless gas given off by the automobile engine through exhaust pipes, mufflers and defective gaskets. This poison is so deadly that it is capable of causing death in a very few minutes. The carbon monoxide unites with the hemoglobin in the red blood cells about 250 times more rapidly than oxygen, thus preventing oxygen from reaching the cells in the body. The result is death by suffocation or lack of oxygen.
- b. Because of the physical characteristics of the gas, its presence is seldom detected. The victim of carbon monoxide poisoning may have one or more of the following symptoms: drowsiness, headache, weakness, ringing in the ears, and in the late stages a throbbing of the heart. If no action is taken to fight off the gas, unconsciousness and finally death follow.
- c. At the very first signs of drowsiness, a driver should get out into the fresh air as quickly as possible in order to replenish the lungs with oxygen. A victim of carbon monoxide poisoning should be taken into the fresh air and given artificial respiration. (Unit XXX) A doctor should be summoned immediately.
- d. To avoid the menace of carbon monoxide every person should observe the following precautions:
 - (1) Never run the engine of a motor vehicle in a closed building. Keep the garage doors wide open when starting the motor.
 - (2) Have the exhaust manifold, muffler and gaskets inspected frequently and repaired or replaced if defective.
 - (3) Keep the engine in the best operating condition by having a qualified mechanic check and repair it periodically.

¹M.S., 1945, Secs. 169.12 and 171.17.

- (4) See that the exhaust pipe extends beyond the rear end of the vehicle.
- (5) Never follow another vehicle closely.
- (6) Provide for cross ventilation at all times by keeping several windows partly open.
- (7) Do not run the engine while remaining in a stationary position for an extended period of time.
- (8) Keep the car floor boards tight and well insulated.
- (9) At the first sign of drowsiness, headache, etc., get out into the fresh air.
- (10) Remember that carbon monoxide poisoning is an ever-present driving hazard.

B. What are the mental and emotional qualifications of a good driver?

1. Intelligence and the ability to control the emotions are prerequisites for a skillful driver. The drivers with physical limitations usually can make adequate compensations and, therefore, do not present as serious a problem to society as the drivers who are mentally and emotionally defective. It is this latter group who are responsible for many of the accidents today.
2. Analyzing and classifying all the different types of undesirable drivers is a difficult task because of the overlapping of specific traits. A bad driver is usually weak or defective in one or more of the following:

a. General Intelligence

The person of low mentality should be eliminated completely from the list of those who accept the responsibility of driving a motor vehicle. The driver must have enough native intelligence to be able to read and interpret traffic signals and road signs, to understand the simple operations and mechanical aspects of a car and to be capable of maintaining mental alertness in order to make correct and rapid responses.

b. Attitude

In answering the question, "What is the right attitude?", it seems best to list some of the undesirable attitudes that drivers commonly exhibit.

(1) The Distracted Driver

The skill of driving should never become too automatic so that the driver feels that he can take his eyes off the road for a few seconds.

A driver often becomes inattentive to the actual job of driving when his attention is absorbed by watching the scenery, advertisements and activity along the road, carrying on an animated conversation with passengers in the automobile, listening to a program on the car

radio, and thinking about personal problems of home or work.

Full attention must be given to the acts of driving or the driver will be unprepared for an emergency, and he will not observe the road signs which give warning of an approaching hazard, such as a curve or a blind intersection. Intelligent and safe driving is a full-time job.

(2) The Discourteous Driver

The word "discourtesy" covers a multitude of driving errors, ranging from the actions of the person who is a reckless and fearless driver to the one who dawdles along the road, thus slowing up the normal flow of traffic. The poor attitudes of discourteous drivers and pedestrians might result from temperament, selfishness, ignorance, illness, or conceit.

(a) The "Show-Off"

The "show-off or reckless" type of driver is the one who turns a corner too fast and who speeds up to a stop sign and then slams on the brakes. He generally has a great deal of manipulative skill but endangers motorists and pedestrians alike because they never can predict his actions. The law states that any person who is willing to take a chance while driving is guilty of reckless driving.¹

(b) The "Dawdler"

The "slow or dawdler" type of driver moves along at an unusually low rate of speed. He frequently drives near the middle of the road or weaves back and forth making passing impossible. No person should drive at such a slow speed so as to impede the normal movement of traffic.

(c) The "Temperamentalist"

The "temperamental" type of driver is a perfect example of one who cannot control his emotions and who resorts to stubbornness, fits of anger, and general ill-humor while making derogatory remarks about the other drivers. The temperamentalist "loses his head" at the slightest provocation and does dangerous and foolish acts to make himself feel important. He totally disregards the rights of others and blames everything on the other fellow.

¹M.S. 1945, Sec. 169.13.

(d) **The "Speed Maniac"**

The "speed maniac" type of driver may be a combination of several types. His prime objective in handling an automobile is to make it go as fast as possible. Speed seems to be an obsession with him.

(e) **The "Road Hog"**

The selfish or "road hog" type of driver thinks he owns the road and refuses to stay in his own lane so that other vehicles may pass. He often does not learn that he is inconsiderate and selfish until he is involved in a serious head-on collision.

(f) **The "Timid" Driver**

The "timid" type of driver is exactly the opposite from the temperamentalist. This timidity and indecisiveness may create a dangerous driving situation because the driver is fearful of every action and reacts in an awkward manner.

c. **Judgment**

Good judgment is an intangible power which the intelligent driver possesses but which produces a tangible result—the cutting down of the number of accidents. Many decisions must be made in split-second time and many must be made in anticipation of a possible situation. The safe and sound thinking driver tries to foresee a hazard and thereby to prevent himself from becoming involved in a critical situation. He is capable of judging speeds and distances, noting traffic situations, making quick decisions and adjustments in emergencies, foreseeing hazards, and predicting the other driver's intention.

3. Every potential driver should pledge himself to exhibit the right attitude behind the wheel. This would include being courteous, sportsmanlike, cooperative, kind and tolerant at all times regardless of the situation.

UNIT XXXIII**WHAT BASIC PRINCIPLES OF AUTOMOBILE
CONSTRUCTION, MAINTENANCE AND OPERATION
SHOULD EVERY DRIVER UNDERSTAND?**

Suggested Time: Five Class Periods

OBJECTIVES

- To understand the principles of automobile construction and operation necessary for efficient driving.
- To develop a sense of responsibility for the proper maintenance of an automobile.
- To understand the essential parts of the automobile and their functions.

SUGGESTED ACTIVITIES**Recognize the Problem**

Examine the interior of an automobile and locate the common devices and controls used by the driver.

Explain why one should study the problem of driving before he drives a car on the highway.

Develop the Problem

Visit a garage and watch a car being lubricated. What parts require grease? What parts require oil?

Name several ways to get maximum mileage out of gas and oil.

Have a trained mechanic exhibit and explain the motor of an automobile at a local garage.

Explain the purposes of the cooling, the lubrication, and the ignition systems.

Prepare a report on any of the following types of insurance and their relationship to safety: property damage, fire and theft, collision, and liability.

Evaluation

Obtain copies of an automobile inspection blank and check the family car.

Interview several drivers in the community. Ask each what the approximate cost of operating his automobile is per month.

TERMS AND CONCEPTS

Ammeter, braking system, carburetor, cooling system, compression stroke, controls, cost of operation, cylinders, differential, electrical system, engine, exhaust stroke, fuel supply, gears, hydraulic,

ignition, indicators, instrument panel, intake stroke, internal combustion engine, lubrication system, maintenance, mechanical, parking brake, pistons, power stroke, service brake, speedometer, starter, steering apparatus, transmission system.

SUGGESTED CONTENT

- A. What mechanical principles involved in the operation of the automobile should every driver understand?
1. In general, every driver should have a basic understanding of the mechanical principles involved in the operation of a car, but a detailed knowledge is not necessary for intelligent driving. To be able to recognize when something is wrong with a car is important, but repairs should be made by skilled and competent mechanics. The parts of an automobile are so numerous and intricate that it is unwise to experiment on an expensive machine.
 2. The functions of the essential parts of the automobile are described briefly below:
 - a. Engine—Supplies the force from the exploding gas which drives the car forward through action of the pistons in the cylinders and the operation of the transmission system.
 - b. Carburetor—Supplies proper mixture of gasoline vapor and air to the engine.
 - c. Ignition—Supplies the electric spark which explodes the compressed mixture of air and gasoline vapor.
 - d. Starter—Puts engine into operation.
 - e. Transmission—Transfers the power produced in the engine to the wheels.
 - (1) Clutch—Connects and disconnects the engine from the transmission system.
 - (2) Gears—
 - (a) Transmission—Combination of different sizes of gears makes it possible to reduce or to increase the speed of revolution of the drive shaft and to change its direction.
 - (b) Differential—Transmits power from drive shaft to rear axles and makes easy turning possible without uneven wear on tires.
 - f. Brakes—Used to slow down or to stop the automobile.
 - (1) Mechanical—Wheels receive pressure exerted on brake drums by means of levers and rods.
 - (2) Hydraulic—Each wheel receives the pressure exerted on brake drums by fluids.

- g. Steering apparatus—Steering wheel is connected by rods, joints, gears and levers to steering arms attached to the front wheels.
 - h. Lubrication system—Permits metal parts of the automobile to slide over each other smoothly through the use of oil and grease, thus giving the parts longer life and better performance.
 - i. Cooling system—Reduces the heat of the engine by use of water being circulated through and around the motor.
 - j. Fuel supply—Gasoline is supplied from a tank usually located at the rear of the car.
3. Some of the important operation controls frequently found in an automobile are the ignition switch, starter, accelerator, clutch, service brake, gear shift lever, choke, parking brake, horn, headlight depressor or dimmer switch, light switches, windshield wiper, defroster, hood lock, heater control, ventilator handle, and turn-signal control.
4. Modern cars are equipped with a number of indicators that keep the driver informed about the operating conditions of the specific parts of the vehicle:
- a. Speedometer—An instrument for indicating the speed or velocity at which the car is traveling.
 - b. Oil pressure gauge—An instrument measuring the pressure of the oil in the motor.
 - c. Ammeter—An instrument for measuring electric current. Discharging or charging of the battery should be carefully noted.
 - d. Fuel gauge—An instrument showing the amount of gasoline in the fuel tank.
 - e. Temperature gauge—An instrument indicating the temperature of the water around the engine to show if the cooling system is working properly.
5. The modern automobile has an **internal combustion engine**. The main part of the engine consists of four, six, eight, twelve, and sometimes, sixteen cylinders cast in a block of metal called the engine block. A piston moves in and out of each cylinder and is made to fit snugly by the use of piston rings. A connecting rod attaches each piston to the crankshaft and transmits the power from the piston to the crankshaft.
6. The pistons operate on the four-cycle principle: an intake stroke, a compression stroke, a power stroke, and an exhaust stroke. In other words, each piston must move twice into and twice out of the cylinder to complete one power cycle.

- a. Most vehicles use gasoline as fuel. The fuel is drawn from the fuel tank through the carburetor where it is mixed with air and supplied to the cylinders. It is the **intake stroke** which "sucks" the gasoline vapor into the cylinder as the piston moves outward. The intake valve closes when the piston has completed one intake stroke.
 - b. The second stroke is called the **compression stroke** because the piston moves inward forcing or compressing the gases into a small space in the cylinder head. This results in a great increase in the pressure for the explosion that will follow. The explosion takes place between the second and third stroke of the piston and is the result of an electric spark being introduced at exactly the right second after the gas is compressed.
 - c. The outward stroke of the piston, which results from the force of the expanding gases produced by the explosion, is known as the **power stroke**. This stroke causes the connecting rod to turn the crankshaft and thus the car receives power to move.
 - d. The last stroke, known as the **exhaust stroke**, forces the exploded gases from the cylinder through the open exhaust valve as the piston moves inward.
7. The **ignition system** develops and carries the electricity to the cylinders, thus causing the gasoline vapor to be ignited. The electricity is developed by a generator which produces enough current to supply the electrical needs of the car, such as ignition, lights, heater and radio, and to keep the storage battery charged. The storage battery supplies the necessary current when the engine is not running. The electricity is carried from the generator to the distributor through insulated wires. The function of the distributor is to get the current to the correct spark plug at the proper time to ignite the gases for the power stroke of each piston.
 8. A **cooling system** is necessary to remove the intense heat produced by the numerous explosions in the cylinders. This prevents damage to the engine. Most modern automobiles are water-cooled. Water circulates through a water jacket surrounding the cylinders. The cylinders give up their heat to the water which then passes through the radiator and becomes cooled. The water is cooled by the fresh air that is constantly drawn through the radiator by the fan.
 9. The **braking system** consists of one of the following two types of service brakes—the mechanical type or the hydraulic type.
 - a. Mechanical brakes operate through an arrangement of rods, levers and cables which force the brake shoe to press the brake linings against the brake drum fastened to the wheel. The resulting friction slows up or stops the auto-

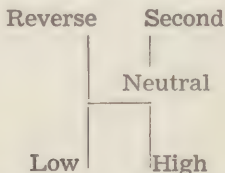
mobile wheels from turning. Mechanical brakes often wear unevenly and should, therefore, be checked often to see if an adjustment is needed. If not perfectly equalized, one or more wheels may receive extra pressure when the brake pedal is pressed down. The car then is apt to swerve.

- b. With hydraulic brakes there is better chance for equal distribution of braking power. The brake pedal controls the action of a piston in the master cylinder filled with a liquid that flows through tubes to smaller cylinders at the brake shoes. Stepping on the brake pedal forces liquid to all the brake shoe cylinders. These smaller cylinders are equipped with pistons which force the brake shoes against the brake drum when pressure is applied to the master cylinder. Friction results, and the car stops.
 - c. A parking brake or hand brake is provided on all automobiles to prevent them from rolling away when they are parked, especially on an incline.
10. The **steering system** used in modern automobiles is very sensitive and makes driving easy. The modern steering mechanism has also reduced the number of accidents caused by steering gear failures. The steering mechanism of the car is attached to the wheels of the car (A-2-g).
11. The **lubrication system** reduces friction and wear, and decreases noise of the intricate moving parts of the car through the use of grease and oil. The more common system of lubrication delivers the oil directly to the various moving parts of the motor by means of tubes connected to the crankcase.

B. How is engine power transmitted and controlled?

- 1. In order to make an automobile move, the power produced by the engine must be transmitted to the wheels. The transmission is the mechanism that transfers this power from the crankshaft to the drive shaft which in turn transmits the power to the axles and wheels.
- 2. The clutch is the mechanism that permits the driver to engage or disengage the motor and the drive shaft. The clutch is located between the motor and the transmission. It permits the driver to stop the car without stopping the engine and to start the car smoothly. When the foot pedal is released, the disks of the clutch are connected, thus transferring power from the engine to the transmission. The car then moves. When the foot pedal is pressed down, one disengages the clutch or disconnects the engine from the other driving parts. The wheels are no longer being turned from engine power.

3. The transmission gears enable the driver to obtain different degrees of power from the engine necessary to drive up a steep hill or to run on a level road. The transmission usually includes gears for several speeds forward and one speed backward.
4. The gear positions of the shift lever for the conventional transmission are diagrammed below:



5. The various speeds for an engine are important to give the car enough power to overcome resistance and inertia. In low gear the transmission gears are placed in such a position that the ratio of the speed of the engine to the speed of the wheels is very high. The engine can thus develop greater power. In second gear this ratio is lower thus making somewhat higher vehicle speed possible. In high gear the ratio of speed between the wheels and engine is reduced still further. The greatest speed can be obtained from the high gear, but the engine is most powerful in low gear. That is why low or second gear is useful for going up a steep grade. In some motor vehicles the transmission is automatic requiring no manipulation by the driver. Other new cars are using a type of hydraulic drive which eliminates the need for a clutch.
6. The power of the engine is transmitted back to the wheels from the transmission gears by a drive shaft. This shaft is connected to the rear axles. If this drive shaft were a rigid mechanism, it would bend or break when the automobile went over a bump. However, every car is provided with one or two universal joints on the drive shaft which permit the drive shaft to move up and down or to work at an angle when the car goes over rough surfaces.
7. When a car is on a curve, the outside wheels must travel a greater distance than the inside wheels travel, therefore, the outside wheels must revolve faster to keep up with other wheels. The rear wheels cannot be attached rigidly to the same axle if the car is going to be capable of turning safely and efficiently. The front wheels act independently of each other and consequently do not present any problem, but the rear wheels are attached to the rear axle, which transmits the driving power to them. The answer to the problem is the differential, a special set of gears placed in the drive housing. The differential gears allow one of the drive wheels to turn faster than the other as the occasion demands.

- C. What economic factors are involved in purchasing and maintaining an automobile?
1. The financial responsibility of owning an automobile is much greater than most people realize. The original purchase price of the vehicle is only the first expense for the consumer. The costs of car maintenance and operation continue as long as the car is in active use.

Common Expenses for Car Operation

Initial Cost.....	\$_____
Depreciation (annual)	_____
Gasoline	_____
Motor Oil.....	_____
Greasing	_____
Tires and Tubes.....	_____
Automobile License.....	_____
Drivers License.....	_____
Insurance	_____
Garage	_____
Repairs	_____
Cleaning the car.....	_____
Incidentals	_____
Fines	_____
TOTAL \$_____	

2. The initial cost is the first and largest item that the consumer must consider. During every year of ownership, the consumer must remember that the automobile depreciates in value. Proper care of the car reduces depreciation costs by increasing the resale or trade-in value.
3. The second largest expense in operating an automobile is gasoline. A gallon of gasoline may be stretched out to 20 miles by slow traveling or it may be burned up in less than 13 miles by speeding. At 25 m.p.h., the car burns 49 gallons of gasoline costing \$9.31 (at 19c per gal.) to travel one thousand miles. At 35 m.p.h. it uses 53 gallons; at 45 m.p.h., 58 gallons; at 55 m.p.h., 65 gallons; at 65 m.p.h., 78 gallons. The cost in the latter case will be \$14.82 figured at the 19c rate.
4. Motor oil should be checked at regular intervals to see if the amount, weight, and kind of oil are suitable for the car at that particular time. A pint or two of oil may be used in 1,000 miles of travel at 25 or 35 m.p.h. but as much as 4 quarts at 65 m.p.h.
5. A greasing job at regular intervals is a valuable investment. A wise driver notices and does something about any unusual squeaks in the automobile.

6. The threat of blowouts is always present so the tires and tubes should be kept in good condition to reduce this hazard. The annual cost of tires and tubes will depend upon their original condition and the amount and type of use they receive.
7. An automobile license must be purchased each year. The cost of the license is determined by the state and varies with make and type of car.
8. Car owners frequently have one or more of the following kinds of insurance on the vehicle: liability and property damage; fire and theft; and collision insurance. (Unit XXXI)
 - a. The first type of insurance (liability and property damage) protects the owner in case of damage done to another person's car and in case of injury of another person.
 - b. Fire and theft insurance protects the owner from loss if his car should be damaged by fire or be stolen.
 - c. Collision insurance protects the owner from loss if damage is done to his own automobile.
9. Every car owner has the responsibility of giving his motor car the reasonable degree of attention that any fine piece of machinery deserves. Both the life of the car and the life of the driver will be lengthened.
 - a. Gasoline, tires and lives can be saved by eliminating the following common faults: Quick getaways, sudden stops, high speeds, soft tires, an inefficient carburetor, faulty or dirty spark plugs, an overfull crankcase.
 - b. To obtain maximum efficiency from an automobile the following services should be performed every 5000 miles: Have a complete motor tune-up, check brakes, drain, flush and refill transmission and rear axle, and have general tightening of car.
 - c. After every 1,000 miles of driving, have a regular car inspection, lubricate the chassis, check storage battery, and check transmission and differential to insure oil being at the proper level.
 - d. Lubrication is the most important thing to consider in car maintenance and care. Serious and expensive damage may result from operating an engine with insufficient oil and with dry bearings. The warnings of such trouble are a drop in the oil pressure gauge followed by a rise in the temperature gauge.
 - e. Watch the cooling system of an automobile carefully. The water surrounding the cylinders must be kept clean; it must circulate freely and never be allowed to run low. Use enough antifreeze in the cooling system in the winter to prevent the water from freezing. In the spring, drain off

the antifreeze, flush the cooling system, using a rust removing preparation if necessary, and refill with fresh, clean water. Special care must be given when a car freezes up or the water in the radiator boils.

- f. The electrical or ignition system of the automobile must be kept in tiptop condition: battery, wiring, carburetor, spark plugs, coil, distributors, and condensers.
- g. The following items are closely connected with the safety and economy of running an automobile:

- Brake maintenance
- Brake adjustment
- Maintenance of lights
- Tire maintenance
- Steering gear and wheel alignment
- Car controls and instruments
- Body work and painting
- Motor care and maintenance

UNIT XXXIV

WHAT ARE THE PRINCIPLES OF LEARNING TO DRIVE, THE DRIVING PROCEDURES AND THE HABITS ONE MUST ATTAIN TO BECOME A SKILLFUL DRIVER?

Suggested time: Six Class Periods

OBJECTIVES

To understand how some of the basic laws of nature affect driving.

To learn the technical skills and habits connected with the efficient operation of a car.

To know the basic knowledge needed for intelligent driving in the city and in the country.

SUGGESTED ACTIVITIES**Recognize the Problem**

Discuss: What common errors do beginning drivers frequently make?

Discuss the desirable and undesirable ways of learning to drive.

Develop the Problem

Prepare a rating chart and use it to check the driving ability of members of the class.

Demonstrate the laws of friction, centrifugal force and momentum.

Find figures and illustrations showing the relationship between speed and the laws of friction, centrifugal force and momentum.

Diagram correct procedure in making left and right turns.

Diagram the gearshift lever knob in its five positions.

Evaluation

Analyze the local community situation as to blind intersections, location of stop signs, types of roads, etc., and decide what special skills are required for driving in each situation.

Prepare a list of driving acts that should be developed into habits.

TERMS AND CONCEPTS

Accelerator, angle parking, anticipation, blind spot, braking power, centrifugal force, choke, clutch, coefficient of friction, dashlight, decelerate, declutch, depressed headlights, defroster, distraction, dual wipers, friction, friction point, first gear, gearshift lever, high gear, illumination, intersection, low gear, maneuver, momentum, neutral, obstructions, oil pressure gauge, panel, parallel parking, position signaling, reverse, stalls, second gear, tread, visibility, water temperature gauge.

SUGGESTED CONTENT

- A. What is the correct position for the driver to take behind the wheel?
 - 1. Be able to see the road ahead clearly through the windshield. Look over the steering wheel, not through the spokes.
 - 2. Adjust seat so that the clutch pedal, brake pedal, and accelerator may all be reached without stretching.
 - 3. Adjust the rearview mirror so that there is a clear view of the road in back without having to turn the head.
 - 4. Place hands on the steering wheel in the position of 10:20 on the clock.
 - 5. Sit comfortably because an improper position leads to muscle strain resulting in fatigue, decreases judgment and increases carelessness.
- B. What is the correct procedure in starting the engine?
 - 1. Test for neutral position of gearshift lever.
 - 2. Press down on clutch pedal.
 - 3. Turn on ignition switch.
 - 4. Push down the starter pedal or button.
 - 5. Release the pressure on the starter pedal, press accelerator, and release clutch.
- C. What should the driver check after starting the engine?
 - 1. Check the instrument panel to see that all gauges are working properly.
 - a. Oil pressure gauge
 - b. Fuel gauge
 - c. Ammeter
 - 2. See that the horn, lights, windshield wiper and heater are able to function correctly.
 - 3. Check windshield and rearview mirror for clear vision.
- D. What are the simple driving acts that must be mastered by the beginner?
 - 1. The car is put in motion in low gear. (Unit XXXIII)
 - a. Press the clutch pedal to the floor.
 - b. Shift transmission into the low gear.
 - c. Release the parking brake lever completely.
 - d. Increase the pressure slightly with the right foot on the accelerator pedal.
 - e. Allow the clutch pedal to come up slowly until it reaches the "friction" or "power point." Hesitate an instant, then gradually let it up fully to engage the clutch and put the car in motion. At the same time increase the pressure on the accelerator.

2. The driver must follow the rules of steering.
 - a. Keep eyes on the road and on traffic conditions.
 - b. Keep hands in correct position. (10:20 on the clock)
 - c. Keep to the right.
 - d. Turn the steering wheel by pulling down from the top of the wheel on the right side for right turns, and on the left side of the wheel for left turns.
3. The driver must learn to stop the car in low gear.
 - a. Take the foot off the accelerator pedal.
 - b. Press the clutch pedal to the floor.
 - c. Press the brake pedal slowly and gradually until the car has come to a stop.
 - d. Place the gearshift lever in neutral position.
 - e. Set parking brake.
 - f. Remove foot from the clutch pedal.
 - g. Remove foot from brake pedal.
4. The next step is learning to shift from low gear to second and then to high gear when the car is moving. (Unit XXXIII)
 - a. Repeat steps as outlined in D-1.
 - b. Press the accelerator pedal until the car is moving at approximately 8 to 10 miles per hour.
 - c. Press the clutch pedal down quickly all the way to the floor and release pressure from accelerator at the same time.
 - d. Move gearshift lever to position of second gear.
 - e. Allow the clutch pedal to come up smoothly, and gradually increase pressure on accelerator.
 - f. Accelerate to approximately 15 or 20 miles per hour.
 - g. Press clutch all the way to the floor and remove pressure from the accelerator.
 - h. Move gearshift lever past neutral to high gear position.
 - i. Allow clutch pedal to come up smoothly; gradually press accelerator down.
 - j. Remove foot from clutch pedal.
5. Skill should be obtained in slowing down and stopping the car from high gear.
 - a. Release pressure on the accelerator.
 - b. Press the service brake intermittently with gradual increases of pressure until speed is reduced to approximately 10 miles per hour.
 - c. Press the clutch pedal to the floor.
 - d. Press steadily on the brake pedal until the car has almost come to a stop, then release the pressure a little for smooth stopping.
 - e. Move the gearshift lever to neutral.
 - f. Keep the pressure on the brake pedal until the parking brake is set.

6. Special skill is needed in backing up.
 - a. Press clutch pedal down.
 - b. Move the gearshift into reverse position.
 - c. Let the clutch pedal up slowly.
 - d. Simultaneously, but gradually, increase the pressure on the accelerator pedal, keeping foot on the clutch pedal.
 - e. Stop by using the same procedure as for stopping from low gear (D-3).
 7. Skill in handling the clutch and accelerator pedal is obtained only through experience.
 - a. Too rapid release of clutch pedal or insufficient supply of gasoline may cause the motor to stall.
 - b. Failure to release clutch pedal evenly and smoothly will cause the car to start forward with a jerk. A jerky start often forces the driver's foot up and down on the accelerator, exaggerating the motion.
 - c. If too much gasoline is fed the motor, the car will lunge with a dangerous jerk.
 8. Stopping, starting, and shifting on an upgrade require special skills.
 - a. To stop while ascending a hill, bring car to stop at the right hand side of the road by using the service brake. Set the parking brake.
 - b. To start on an upgrade, hold the car in place by the parking brake, shift into low gear, and start the car moving in the usual manner, releasing the parking brake just as the clutch is engaged. Timing is essential to avoid stalling the engine.
 - c. In climbing upgrades where it is necessary to shift from a higher to a lower gear, depress the clutch, accelerate and shift into the lower gear almost simultaneously.
- E. What are the special maneuvers the driver must learn to make?
1. There are several factors to consider in preparing to make a turn.
 - a. Give the proper signal at the proper distance before making the turn. Give signal by hand if car is not equipped with a mechanical signal. (Unit XXXV)
 - b. Move into the proper lane before reaching the intersection. For a left turn the car should be near the right side of the center line of the street. For a right turn the car should be near the right edge of the street.
 - c. Reduce speed.
 - d. Regardless of the direction of the turn keep the following items in mind:

- (1) Select correct gear before making turn. In traffic or on hills it may be necessary to shift to a lower gear.
 - (2) Begin turning at the correct point. If going to the right, keep close to the curb. To make a left turn, begin to turn after crossing the pedestrian cross walk. Enter the new street in the lane just to the right of the center line.
 - (3) Avoid cutting the corner on a turn.
 - (4) Avoid swinging to the left before making a right turn.
 - (5) Use the hand-over-hand technique when turning the steering wheel.
 - (6) After completing the turn enter the correct driving lane.
2. Turning the car around efficiently requires skill.
- a. Do not turn a car around where it is possible to go around the block. In locations where this cannot be done, make a "U" turn.
 - b. Do not make a "U" turn where traffic is heavy, where the street is too narrow to permit the complete turn without backing up, or where a "U" turn is prohibited.
 - c. Steps in making a "U" turn.
 - (1) Stop the vehicle as near to the right side of the road as possible.
 - (2) Look for approaching vehicles and pedestrians.
 - (3) Give the proper left turn signal and then proceed cautiously in making a left about turn at a slow speed and in low gear.
 - (4) Use hand-over-hand technique for turning the steering wheel.
 - (5) Straighten the car at the proper time to complete the turn in the correct lane.
3. Practice is required to become skillful in parallel parking.
- a. Draw up beside the car ahead of the parking space, giving the signal to stop, stopping one or two feet away from the car, with the rear bumpers approximately in line.
 - b. Back slowly, slipping the clutch and turning the steering wheel sharply to the right, until the car is at a 45° angle with the curb. The front bumper is now even with the rear bumper of the car ahead.
 - c. Continue backing slowly, at the same time turning the wheels sharply to the left. Back into the parking space. Straighten the wheels and center the car in the parking space.
 - d. To leave the parking space, back the car slowly until it almost touches the car behind, turning the steering wheel sharply to the right at the same time.

- e. Turn wheels sharply to the left. Look both ways to see that the street is clear with no vehicles approaching. Give the signal for a left turn and put car into motion. In case the parking space is so short that the car ahead cannot be cleared, repeat the process.
- 4. Angle parking is easier for some drivers than parallel parking in a limited space but is more dangerous on a busy street.
 - a. Allow enough room between the sides of your car and the cars in the stalls on either side to prevent striking them in turning into the space.
 - b. Use caution when backing out of an angle parking stall. Make sure the road is clear, back slowly and be ready to stop instantly. Remember that vision is limited when backing out of an angle parking area.
- 5. Special caution should be used in parking a car on an up or downgrade.
 - a. On an upgrade, park correctly, then point the front wheels to the left and let the car roll back until the front tire touches the curb lightly. Set the parking brake, and put the gearshift lever into low gear position.
 - b. On a downgrade, park correctly; then point the front wheels to the right and let the car roll forward until the front tire touches the curb lightly. Set the hand brake and put the gearshift lever into reverse gear position.
- F. What are the special skills which are developed into habits by the best drivers?
 - 1. The art of anticipation is invaluable to the driver.
 - a. Anticipate what the car ahead is going to do by observing its slight changes in speed and position.
 - b. Anticipate other driver's actions by subtle signs and evidence, such as the driver of a vehicle giving an indication of what he intends to do by maneuvering his car in the proper position at the proper time. This is known as position signaling.
 - 2. The expert driver drives evenly without sudden or impulsive action.
 - a. Changes of speed and direction are started early and are executed smoothly.
 - b. Brakes are used as little as possible. Determine in advance the necessity of slowing or stopping and decelerate by letting up on the accelerator.
 - c. Acceleration should be built up gradually between gear shifting. Maintain a steady pace and avoid violent acceleration or deceleration.

- d. Enter a curve slowly enough so that deceleration is not necessary on the curve itself.
 - e. Do not drive with the foot on the clutch pedal. This causes the clutch to slip and to wear excessively.
- G. What are the natural laws affecting the action of a car which the driver must consider?
- 1. Friction can aid or hinder control.
 - a. When the car has perfect brakes, the ability to stop is determined by the friction between the tread of the tires and the surface of the road.
 - (1) Amount of tread on any one tire in contact with the road at any one instant is an area only as large as the sole of the shoe.
 - (2) Actual grip present at a given time depends upon the coefficient of friction. This friction is cut down by ice, snow, sleet, rain or wet leaves.
 - b. Skidding occurs when the tires lose their grip on the road. Skidding causes the engine to lose its pulling effect, the brakes to lose their braking effect, and the wheels to act as sled runners which slide rather than roll.
 - c. There are several causes of skids:
 - (1) Sudden increase in braking power or engine pull.
 - (a) Slow down gradually by applying brakes gently and intermittently, releasing brakes if any hint of skidding is felt.
 - (b) To slow down the car by using the brake, do not disengage the clutch.
 - (2) Side slip on a curve or corner.
 - (3) Unequal grip of the brakes.
 - (4) Dead leaves on the road, loose gravel, dry sand, soft shoulders on edge of highway and slippery pavements.
 - d. Keep calm if the car starts to skid.
 - (1) Do not apply brakes suddenly.
 - (2) Take foot off accelerator, release the brake, and turn the front wheels in the direction the car is skidding.
 - e. Starting on a slippery or icy road, or while stuck in mud or snow, should be done without racing the engine or spinning the rear wheels.
 - (1) To start on a slippery surface, apply the power to the rear wheels gradually. Start in second gear, engage the clutch slowly and evenly.
 - (2) To get out of a mud hole, put the car in low gear, rock the car backward and forward a few times by shifting quickly from low to reverse and back again, let up clutch and accelerate the motor. Branches, rocks, sacks,

or blankets may be placed under the wheels to provide better traction.

- (3) In snow use chains. If chains are not available, start in second gear, avoid spinning the wheels, rock the car if possible by pushing in the clutch and allowing the car to roll back. Do not try to shift from second gear until reaching a clear road. The use of sand, cinders and blankets under the wheels will help to provide better traction.
2. Centrifugal force, the tendency of all moving objects to move outward from the center of rotation, greatly affects driving when the car turns a corner or goes around a curve. The driver may lose control of the car.
 - a. Before entering a curve, reduce speed so that centrifugal force will not cause loss of control.
 - b. The sharper the curve, the greater is the need for reducing speed.
 - c. Superelevated or banked curves will help counteract the tendency to leave the road. The old roads are flat at the curves, some even slope down on the outside edge, making them very dangerous.
3. Precautions are necessary because of the law of gravity.
 - a. When a car starts down a hill, the stopping distance is automatically lengthened.
 - b. Braking distance is increased with the steepness of the downgrade.
 - c. Brakes should not be applied continuously on downgrades in order to avoid burning out the brakes.
 - (1) Releasing the pressure on the accelerator will reduce speed. The engine then acts as a brake.
 - (2) Steep downgrades require application of the service brakes, and, in some cases, shifting into second or low before starting the descent, allowing the engine to help act as a brake.
 - d. A car in motion tends to keep moving. Momentum is increased on a downgrade because the force of gravity is acting on the vehicle. Do not declutch and allow the car to "free wheel" downhill.
- H. What are other natural hazards which the driver must meet?
 1. Visibility is affected by fog, snow, sleet, rain or ice forming on the windshield, thus making driving dangerous.
 - a. Depress headlights or use foglights.
 - b. Drive with caution at a slow speed. Be constantly alert.
 - c. Be sure defrosters and windshield wipers are in good operating condition.

2. Landscape reduces visibility. Do not pass other vehicles where visibility is limited by brush, trees, signs, hills or any other object.
- I. What are the basic rules needed for intelligent driving in the country?
 1. Follow the car ahead at a safe distance. Keep far enough away to avoid crashing into the rear if the car ahead stops suddenly. (Unit XXXIII)
 2. Watch the second car ahead for any possible advance warning of trouble.
 3. Pass other vehicles with special care. Pass only if the road is clear.
 - a. Pass on the left of the vehicle ahead. Pass on the right only where specifically permitted, as in multiple lane highways.
 - b. Consider the speed at which the vehicle being passed is moving.
 - c. Do not pass on a hill, on a curve, or where vision is restricted.
 - d. Use courtesy in passing. Give way to the "road hog." Never race a car that is attempting to pass.
 4. Change lanes in multiple highways only after making sure the shift will not interfere with the traffic behind.
 5. Slow up when approaching intersections. Never be assured that the other driver or pedestrian will give up the right of way.
 6. Slow up when approaching railroad crossings. Be sure all tracks are clear before starting to cross them.
 7. Be alert at all times in case a blowout occurs. Blowouts cause the car to lurch toward the side of the blown out tire.
 - a. Grip the steering wheel firmly and concentrate on steering the car.
 - b. Apply the brakes only after the direction of the car is controlled and then apply lightly and intermittently.
 8. Be especially careful during night driving because of additional hazards.
 - a. Visibility is usually not over a few hundred feet at night.
 - (1) Distances and positions are not easily identified in the dark for more than 150 feet.
 - (2) At 50 miles per hour you cannot stop in less than 221 feet. (Unit XXXII)
 - b. Oncoming headlights frequently blind night drivers. It takes several seconds to recover vision.
 - (1) Do not look directly at the headlight, but look at the right side of the road. Reduce speed.
 - (2) "Dim" lights, even though oncoming car does not.

- c. One-eyed automobiles are a menace to night traffic.
 - (1) Always assume that the unlighted lamp of an automobile is on the side nearest your car as it approaches.
 - (2) Slacken speed, pull over to right side.
- J. What are the basic rules needed for intelligent driving in the city?
 - 1. Vehicles approaching a public street from a garage, driveway, or alley are required to stop and yield the right of way to traffic on the street.
 - 2. The speed used on city streets is usually restricted. Conform to the speed of a stream of traffic to prevent unnecessary passing and cutting in.
 - 3. Expert drivers choose the correct lane.
 - a. Travel in the center lane of a three lane highway only when passing another vehicle.
 - b. Make a left turn from the lane on the right of the center line; a right turn from the right lane.
 - 4. Signs, signals, and markings are installed for safety and convenience.
 - a. Do not attempt to beat the signal.
 - b. Obey all markings indicating passing, parking, and slow areas.
 - (1) Respect safety zones.
 - (2) Park as indicated by the markings or signs.
 - (3) Park close to the curb and in the prescribed area.
 - 5. City driving presents many distractions.
 - a. Children at play.
 - b. Bicycles.
 - c. Sign boards, store windows.
 - d. Heavy traffic.
 - 6. Special caution must be used under the following circumstances.
 - a. In the vicinity of parks, theaters, factories.
 - b. During rush hours, such as morning, noon, and evening.
 - c. In shopping districts.
 - d. Behind streetcars. Stop at least 10 feet behind a streetcar discharging or taking on passengers.
 - e. Near schools and playgrounds.
 - 7. Certain situations require special actions.
 - a. Ambulances, fire engines, and police cars on emergency calls have right of way over all traffic. Drive to the curb and allow them to pass.
 - b. Funeral processions have right of way. Do not cut into or through such a procession. Cars in funeral processions should have lights turned on. (Unit XXXV)

UNIT XXXV

WHAT RULES AND REGULATIONS AND HIGHWAY IMPROVEMENTS HAVE BEEN MADE TO MAKE DRIVING AS SAFE AS POSSIBLE?

Suggested Time: Five Class Periods

OBJECTIVES

To know and observe the rules of the road.

To know how the highways have been improved to promote safe driving

To understand how to read a highway map.

SUGGESTED ACTIVITIES**Recognize the Problem**

Secure road maps and trace the routes over the best constructed roads to points of special interest. Learn the meaning of the map legend or key.

Explain how a driver's license is obtained in the State of Minnesota.

Discuss: What is a good rule regarding right of way?

Develop the Problem

Make large diagrams of the general groups of highway signs. Color, label and post in classroom.

Ascertain the speed limits in the community.

Find out how much money is spent for road construction and maintenance within the local county. How is the revenue obtained?

List the unlawful acts for which a driver's license may be suspended or revoked.

Discuss the dangers of overloading the front seat of an automobile.

Evaluation

Demonstrate hand signaling for left and right turns and as a warning.

Plan and mark out a trip, starting from the local community, on a road map of the United States. Mark the historic spots and places of scenic beauty.

TERMS AND CONCEPTS

Asphalt, bituminous surface, caution signs, clover-leaf, concrete, county aid roads, hand signals, highways, informatory signs, intersections, Federal Aid Road Act, lanes, maps, parking regulations, passing, radius, regulatory signs, right of way, rotary, slow type signs, speeding, state aid roads, surface markings, traffic control signals, traffic regulations, town roads, trunk highways.

SUGGESTED CONTENT

A. What are some of the state traffic laws?

NOTE: Space does not permit a complete listing of all traffic laws. A copy of these laws may be obtained from the Minnesota Department of Highways. More detailed information on traffic laws may be found in "Lessons in Traffic Safety" which is available from the Minnesota Department of Education or the Minnesota Department of Highways.

1. Drivers license law

a. The Department of Highways **cannot** issue a driver's license:

- (1) To any person who is under the age of 15 years; nor to any person under 18 years unless the application for license is approved by the parent or guardian of the applicant. In the event that there is no parent or guardian, the employer of the applicant may sign the application.
- (2) To any person who is an habitual drunkard as determined by competent authority, or is addicted to the use of narcotic drugs.
- (3) To any person who has previously been adjudged insane, inebriate, epileptic or feeble-minded unless the department is satisfied that such person is competent to operate a motor vehicle with safety to persons or property.
- (4) To any person who is required by the drivers' license law to take an examination, unless such person shall have successfully passed such examination.
- (5) To any person who is required under the provisions of the safety responsibility laws of this state to deposit proof of financial responsibility and who has not deposited such proof.
- (6) To any person when the commissioner has good cause to believe that the operation of a motor vehicle on the highways by such person would be inimical to public safety or welfare.
- (7) To any person when, in the opinion of the commission, such person is afflicted with or suffering from such physical or mental disability or disease as will affect such person in a manner to prevent him from exercising reasonable and ordinary control over a motor vehicle while operating the same upon the highways; nor to a person who is unable to read and understand official signs regulating, warning and directing traffic.

- (8) To any person whose license has been revoked except upon furnishing proof of financial responsibility in the same manner as provided in the Safety Responsibility Act and if otherwise qualified.¹

b. Instruction permits

The Department of Highways may issue an instruction permit to any person who is learning to drive and is otherwise qualified. This permit is good for 60 days and on condition that such person is accompanied by a licensed driver.²

c. Licenses issued

The department shall issue to every qualified applicant a drivers license upon the payment of the required fee. No license shall be valid until it has been so signed by the licensee.³

d. License to be carried and exhibited on demand

Every licensee shall have his license in his immediate possession at all times when operating a motor vehicle and shall display the same, upon demand by proper authorities.⁴

e. Suspension of license

The commissioner shall have authority to and may suspend the license of any driver without preliminary hearing upon a showing by department records or other sufficient evidence that the licensee:

- (1) Has committed an offense for which mandatory revocation of license is required upon conviction; or
- (2) Has been involved as a negligent driver in any accident resulting in the death or personal injury of another or serious property damage; or
- (3) Is an habitually reckless or negligent driver of a motor vehicle; or
- (4) Is an habitual violator of the traffic laws; or
- (5) Is incompetent to drive a motor vehicle; or
- (6) Has permitted an unlawful or fraudulent use of such license; or
- (7) Has committed an offense in another state which if committed in this state would be grounds for suspension.⁵

¹Minnesota Statutes 1945, Sec. 171.04.

²M. S. 1945, Sec. 171.05.

³M. S. 1945, Sec. 171.07.

⁴M. S. 1945, Sec. 171.08.

⁵M. S. 1945, Sec. 171.18.

f. Unlawful use of license

It shall be unlawful for any person:

- (1) To display or cause or permit to be displayed or have in his possession any cancelled, revoked, suspended, fictitious or fraudently altered driver's license; or
- (2) To lend his driver's license to any other person or knowingly permit the use thereof by another; or
- (3) To display or represent as one's own any driver's license not issued to him; or
- (4) To fail or refuse to surrender to the department upon its lawful demand any driver's license which has been suspended, revoked or cancelled; or
- (5) To use a false or fictitious name in any application for a driver's license or to knowingly make a false statement or to knowingly conceal a material fact or otherwise commit a fraud in any such application.¹

g. Driving while license is suspended or revoked

Any person whose driver's license or driving privilege has been cancelled, suspended or revoked as provided in this chapter, and who shall operate any motor vehicle, the operation of which requires a driver's license, upon the streets or highways in this state while such license or privilege is canceled, suspended or revoked shall be guilty of a misdemeanor.²

2. Motor vehicle registration law

Every owner of an automobile must register it annually in order to receive a certificate of registration and license plates which permit its operation on a public highway.³

3. The right of way⁴

The term "right of way" means the privilege to make immediate and prior use of the highway.

a. Motor vehicles

(1) Approaching the intersection

The driver of a vehicle **approaching** an intersection shall yield the right of way to a vehicle which has **entered** the intersection from a different highway.

When two vehicles enter an intersection from different highways at approximately the same time the driver of the vehicle on the left shall yield the right of way to the vehicle on the right.

¹M. S. 1945, Sec. 171.22.

²M. S. 1945, Sec. 171.24.

³M. S. 1945, Sec. 168.10.

⁴M. S. 1945, Sec. 169.20.

The foregoing rules are modified at through highways, and otherwise as hereinafter stated in this section.

The driver of any vehicle or street car traveling at an unlawful speed shall forfeit any right of way which he might otherwise have hereunder.

(2) At intersections—left turn

The driver of a vehicle within an intersection intending to turn to the left shall yield the right of way to any vehicle approaching from the opposite direction which is within the intersection or so close thereto as to constitute an immediate hazard.

(3) Through highways

The driver of a vehicle shall stop at the entrance to a through highway and shall yield the right of way to other vehicles which have entered the intersection from the through highway or which are approaching so closely on the through highway as to constitute an immediate hazard.

(4) Driver entering highway shall yield right of way

The driver of a vehicle entering or crossing a highway from a private road or driveway shall yield the right of way to all vehicles approaching on such highway.

(5) Emergency vehicle to have right of way

Upon the immediate approach of an authorized emergency vehicle, when the driver is giving audible signal by siren, the driver of every other vehicle shall yield the right of way and shall immediately drive to a position parallel to, and as close as possible to, the right-hand edge or curb of the highway clear of any intersection, and shall stop and remain in such position until the authorized emergency vehicle has passed, except when otherwise directed by a police officer.

(6) Funeral procession to have right of way

When any funeral procession identifies itself by using regular lights on all cars and by keeping all cars in close formation, the driver of every other vehicle, except an emergency vehicle, shall yield the right of way.¹

(7) Trains

Trains have the right of way at all crossings. The driver of a vehicle should stop at least ten feet from the nearest track of a railroad grade crossing when-

¹M. S. 1945, Sec. 169.20.

ever a signal or human flagman gives warning of the immediate approach of a train. He shall not proceed across the railroad grade crossing until he can do so safely.¹

b. Pedestrians

Pedestrians, as well as motorists, are confronted with right of way problems and consequently should be familiar with the laws also.

(1) To have right of way in certain cases

Where traffic-control signals are not in place or in operation, the driver of a vehicle shall yield the right of way, slowing down or stopping if need be to so yield, to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk, at an intersection.

It shall be unlawful for any person to drive a motor vehicle through a column of school children crossing a street or highway or past a member of a school safety patrol while such member is directing the movement of children across a street or highway and while the school safety patrol member is holding his official signal in the stop position.²

(2) To yield right of way when not crossing at crosswalks

Every pedestrian crossing a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right of way to all vehicles upon the roadway.

Any pedestrian crossing a roadway at a point where a pedestrian tunnel or overhead pedestrian crossing has been provided shall yield the right of way to all vehicles upon the roadway.²

(3) Street cars

The pedestrian going to and from a street car shall have the right of way over all vehicles whether or not a safety zone is provided.³ No vehicle shall at any time be driven through a safety zone.⁴

4. Speed

- a. There are two types of speed limits: Absolute and prima facie. An **absolute speed limit** is a maximum limit. No vehicle can be legally operated at a speed in excess of that

¹M. S. 1945, Sec. 169.26.

²M. S. 1945, Sec. 169.21.

³M. S. 1945, Sec. 169.24.

⁴M. S. 1945, Sec. 169.25.

limit under any conditions. In a **prima facie speed limit**, no vehicle can be legally operated at a speed in excess of that limit unless it is safe to do so after consideration of all existing conditions.

- b. An absolute speed limit of thirty miles per hour exists in any municipality unless otherwise indicated on official signs. A prima facie speed limit of 60 miles per hour during the daytime and of 50 miles per hour during the nighttime exists on all unzoned streets and highways beyond the limits of cities and villages.
- c. Only the Commissioner of Highways is authorized to establish safe speed limits on the streets and highways of Minnesota. The speed limit, as determined, by the Commissioner, is stated on signs erected along the zoned highways. Such speeds then become the legal absolute speed limits on that highway. A very careful engineering and traffic investigation is conducted by the Commissioner before a highway is zoned.

Safe speed limits may be established by the Commissioner for bridges or other elevated structures also. After a sign, declaring this speed limit, has been placed at each end of the bridge or structure, the posted limit then becomes an absolute speed limit.

- d. Speed limits, heretofore mentioned, do not apply to authorized emergency vehicles when responding to bona fide emergency calls. This category includes ambulances, police and fire department vehicles. The driver of such vehicles must give an audible signal by siren and display two lighted red lights in front. The driver of an emergency vehicle must drive with due regard for all persons using the street because he is responsible for reckless disregard of the safety of others.¹
- e. Excessive speed results in many accidents. If there is an accident at high speed, it will nearly always be a serious one with only a slim chance of avoiding death or serious injury. It takes 8½ minutes to go 5 miles at a 35 miles per hour average and 6.7 minutes are required to go 5 miles traveling at an average of 45 miles per hour. Less than 2 minutes are saved in 5 miles by increasing speed 10 miles per hour—even less on shorter distances.
- f. The law states that the driver of any vehicle shall, consistent with the requirements, drive at an appropriate reduced speed when approaching and crossing an intersection or railway grade crossing, when approaching and going around a curve, when approaching a hill crest, when travel-

¹M.S. 1945, Sec. 169.14 to 169.17.

ing upon any narrow winding roadway, and when special hazards exist with respect to pedestrians or other traffic or by reason of weather or highway conditions.¹

- g. Speed should be reduced when driving on streets covered by rain, snow, frost or ice because the tires of a vehicle will not grip the surface effectively. Skidding often results, and the motor vehicle becomes difficult to control, on slippery surfaces.
- h. Night driving presents special hazards which make a reduction in speed advisable. At night, a driver is usually less alert because of fatigue and drowsiness. He sees less well in the dark. Even the best headlights do not have enough range for driving over fifty miles per hour at night. Headlights of approaching vehicles often give off a glaring and blinding light making the position on the road uncertain. Pedestrians who wear light colors at night may be seen in sufficient time to permit a driver to stop without accident.
- i. A vehicle should never be driven at a high rate of speed if it has worn parts or equipment such as poor tires, a loose steering mechanism, faulty brakes or a dirty, discolored or cracked windshield.
- j. In contrast to the speeder, the type of driver is frequently found who impedes or blocks the normal and reasonable movement of traffic and causes accidents by driving his automobile at too slow a speed. A driver should keep his vehicle close to the right edge or curb of the street so that he does not block traffic if he must travel slowly.

5. Parking

- a. The act of parking, or the location of the parking space, may be a cause of accidents especially if the parked vehicle obstructs the view of another driver or blocks the normal movement of traffic.
- b. Stopping, standing and parking. Upon any highway outside of a business or residence district no person shall stop, park, or leave standing any vehicle, whether attended or unattended, upon the paved or improved or main traveled part of the highway when it is practical to stop, park, or so leave such vehicle off such part of said highway.
- c. Parking on roadway. Except where angle parking is permitted by local ordinance, every vehicle stopped or parked upon a roadway where there is an adjacent curb shall be so stopped or parked with the right-hand wheels of such vehicle parallel with and within 12 inches of the right-hand curb.²

¹M. S. 1945, Sec. 169.14 (Subd. 3).

²M. S. 1945, Sec. 169.35.

- d. Brakes must be set. No person driving or in charge of a motor vehicle shall permit it to stand unattended without effectively setting the brake thereon and turning the front wheels to the curb or side of the highway.¹
- e. Where stops are prohibited. No person shall stop, stand, or park a vehicle, except when necessary to avoid conflict with other traffic or in compliance with the directions of a police officer or traffic-control device, in any of the following places:
 - (1) On a sidewalk;
 - (2) In front of a public or private driveway;
 - (3) Within an intersection;
 - (4) Within ten feet of a fire hydrant;
 - (5) On a crosswalk;
 - (6) Within 20 feet of a crosswalk at an intersection;
 - (7) Within 30 feet upon the approach to any flashing beacon, stop sign, or traffic-control signal located at the side of a roadway;
 - (8) Between a safety zone and the adjacent curb or within 30 feet of points on the curb immediately opposite the ends of a safety zone unless a different length is indicated by signs or markings;
 - (9) Within 50 feet of the nearest rail of a railroad crossing;
 - (10) Within 20 feet of the driveway entrance to any fire station and on the side of a street opposite the entrance to any fire station within 75 feet of said entrance when properly sign posted;
 - (11) Alongside or opposite any street excavation or obstruction when such stopping, standing, or parking would obstruct traffic;
 - (12) On the roadway side of any vehicle stopped or parked at the edge or curb of a street;
 - (13) Upon any bridge or other elevated structure upon a highway or within a highway tunnel, except as otherwise provided by ordinance;
 - (14) At any place where official signs prohibit stopping.

No person shall move a vehicle not owned by such person into any prohibited area or away from a curb such distance as is unlawful.

No person shall, for camping purposes, leave or park a house trailer on or within the limits of any highway or on any highway right of way, except where signs are erected designating the place as a camp site.

No person shall stop or park a vehicle on a street or highway when directed or ordered to proceed by any peace officer invested by law with authority to direct, control or regulate traffic.²

¹M. S. 1945, Sec. 169.36.

²M. S. 1945, Sec. 169.34.

- f. Parking may be restricted on streets and highways within cities and villages by local ordinance. A rule limiting the time an automobile may be parked in one place is frequently applied to congested streets where the available parking space is not sufficient to accommodate all who wish to use it. Time limits of 10, 15, 30, 45 and 60 minutes are common. Automobiles parked for longer than the legal limit are subject to being tagged by police officers, and the owners are required to pay a fine. Larger cities provide parking meters which require the motorist to deposit a fee for the privilege of parking in business districts for a limited time. It is our duty to observe all parking rules in order to insure the greatest safety and convenience for all concerned.

6. Passing

- a. Illegal passing results in many serious accidents. The driver fails to judge distances in relation to speed and thinks that he has sufficient space and time to pass another car before the approaching car reaches him. A tragic head-on collision often results. This type of accident is usually more dangerous than others because the force of the impact is the result of the speeds of both cars. The impact of two cars colliding head-on at 45 miles per hour is twice as great as the impact resulting from one car striking a stationary steel or concrete structure while traveling at 45 miles per hour. Improper passing also results in one or both vehicles going into the ditch when the driver of the passing vehicle cuts in too soon to avoid an oncoming car.
- b. Passing school buses. The driver of a vehicle upon a highway outside of a business or residence district, upon meeting or overtaking any school bus which has stopped on the highway for the purpose of receiving or discharging any school children, shall come to a complete stop and shall not resume motion until the school bus has completed loading or unloading passengers.¹

7. Overcrowding the vehicle

- a. No person shall drive a vehicle when it is so loaded, or when there are in the front seat such number of persons, exceeding three, as to obstruct the view of the driver to the front or sides of the vehicles or as to interfere with the driver's control over the driving mechanism of the vehicle.

No person in a vehicle or street car shall ride in such position as to interfere with the driver's or motorman's view

¹M. S. 1945, Sec. 169.44.

ahead or to the sides, or to interfere with his control over the driving mechanism of the vehicle or street car.¹

- b. The front seat of the average automobile is usually wide enough to seat three persons. However, in many small automobiles three persons crowd the front seat and an accident may result if anything interferes with the free use of the driver's arms and legs.

8. Equipment

- a. Every automobile must be equipped with two head lamps, no more, no less, one on each side of the front of the car. These lamps must be so arranged that the beams may be projected downward when meeting an approaching automobile. The law stipulates that this must be done within 1000 feet of the approaching vehicle.² Courtesy should prompt this action even without a law. Certain auxiliary lamps, such as fog lights and spot lights, are permitted on a car, but the total number burning should not exceed four.
- b. Rear lamps are also required by law. Vehicles must exhibit a red light plainly visible from a distance of 500 feet to the rear. The law also demands that all vehicles bear a rear reflector so that protection will be present in case the rear lamp should fail or the bulb burn out. Every such reflector shall be so designed and maintained as to be visible at night from all distances within 300 feet to 50 feet from such vehicle (except that on a commercial vehicle the reflector shall be visible from all distances within 500 feet to 50 feet from such vehicle) when directly in front of a motor vehicle displaying lawfully lighted head lamps.³
- c. The rear registration plate must be illuminated by a white light which may be either a part of or separate from the rear lamp. This light must illuminate the plate so that it will be clearly legible from a distance of 50 feet to the rear and must be controlled by the same switch as the rear lamp.⁴
- d. The condition of brakes, horns, mufflers, rearview mirrors, windshields, tires and bumpers is also regulated by law to promote safe driving.

¹M. S. 1945, Sec. 169.37.

²M. S. 1945, Sec. 169.60, 169.61.

³M. S. 1945, Sec. 169.50.

⁴M. S. 1945, Sec. 169.50.

9. Signaling

- a. The law requires that any driver intending to decrease the speed of his vehicle, to stop or to turn right or left shall indicate his intention by giving an appropriate signal. This action is necessary to warn approaching or following drivers so that they may guide their vehicles accordingly and thus avoid an accident. The signals may be given either by means of the hand and arm, a signal lamp or a signal device attached to the vehicle.¹
- b. The hand and arm are commonly used for signaling. Three positions are recommended. To signal for a left turn, the hand and arm should be held in a horizontal position straight out from the left side of the vehicle. To signal a right turn, the hand and forearm should be held in an upward position at about a 90° angle. To signal for slowing down or stopping, the hand and forearm should be held in a downward position. The arm must be extended fully beyond the vehicle, and the position of the arm must be correct in order that the signal is clearly visible and understandable to motorists and pedestrians.

B. What signs and signals are provided for the driver's convenience and safety?

1. Modern day traffic has become so complicated that particular effort is being exerted to bring about a uniform means of regulating, warning and guiding traffic. Traffic control devices not only guide the route of the motorist, but also protect his safety. A very important problem which confronts cities and states is the establishment of uniform signals, signs and markings. A motorist can very easily travel through a number of cities and several states in one day and can become very confused if each city has a different traffic signal system. This problem started the movement for uniformity in all states. The American Association of State Highway Officials and the National Conference on Street and Highway Safety has established a "Manual on Uniform Traffic Control Devices for Streets and Highways." The manual was adopted as an American standard by the American Standards Associations on Nov. 7, 1935.

The State of Minnesota uses these standards.

2. The traffic control devices are divided into the following groups:

a. Traffic Signs

- (1) Modern highway speeds and complex intersections require signs which can be seen at long distances and understood almost instantly. The following characteristics of signs have been standardized to provide uni-

¹M. S. 1945, Sec. 169.19.

formity of appearance and meaning and to make even the most casual driver familiar with them:

Shapes, colors, location, symbols, wording or lettering.

- (2) Except on one-way roads or streets traffic signs are always erected on the right side of the highway facing the approaching motorist.
- (3) Traffic signs can be divided into three general groups, each of which has a distinctive shape. The motorist can then understand the significance of the sign from the shape itself. The three groups are as follows: Regulatory, warning and guide.

- (a) Regulatory signs. These signs regulate the movements of a driver, and indicate legal requirements that can be enforced. They require him to stop, limit his speed, refrain from passing in a specified area or keep to the right. With the exception of the "STOP" sign, all regulatory signs have black letters on a white background and are vertical rectangular in shape. The "STOP" sign is the only highway sign which is octagonal in shape. This sign **always** requires a full stop.

- (b) Warning signs include three types of signs: The slow-type which is always diamond-shaped, the caution type which is square, and the railroad advance warning sign which has a distinctive round shape. The latter is the only round sign.

- 1'. Slow-Type Signs — Slow-type signs are placed along the highway to warn the motorists of some permanent physical hazard requiring a reduction in speed for safety. All "SLOW" type signs have black letters or symbols on a yellow background and are always diamond-shaped. They are used to mark dangerous conditions, such as, curves, turns, dips, steep hills and so forth.

- 2'. Caution Signs—A caution-type sign is used for the following conditions where there is a potential operating hazard, requiring extra alertness on the part of the driver: Crossroads and side roads, advance warning of traffic-control signals, men working on a highway, pedestrian zones, animal crossings, school or hospital zones, playgrounds and so forth.

All caution signs are painted with black letters on a yellow background and are square in shape.

3'. Railroad Advance Warning Signs—The railroad advance warning signs are always round with black letters on a yellow background. Round signs are never used except to warn of a railroad crossing ahead. Such a sign should make the motorist very alert. He should slow down and look carefully in both directions to be sure that no train is approaching before crossing the railroad tracks.

- (c) Guide or Informatory Signs. Guide signs are used to furnish the traveler with directional and locational information such as the highway route he is using or approaching, the body of water he is crossing or passing, the town he is entering and so forth. Except in the case of route markers, this type of sign is a horizontal rectangle (wider than it is high) and always has painted black letters or numerals on a white background. Route markers denoting a U. S. (interstate) route are shield shaped and those denoting a state or local highway are distinctive for each state. Minnesota state highway route markers have a star on a square sign. In some states the shape of the sign resembles the outline of the state. Other guide signs may be used to inform traffic of the direction and distance to various destinations, to indicate prominent physical features contiguous to a highway, such as lakes, streams, and park or forest areas, and to convey important information, such as, limited clearance, tourist camp and Red Cross first aid stations.

b. Traffic Markings

- (1) Highways are frequently marked with painted lines and stripes to guide the motorists and pedestrians. Practically all hard-surfaced roads have center-line stripes to encourage motorists to drive on the right side of the road. Lines marked on pavements may indicate one of the following:

Center of roadway

Traffic lanes

"No passing" zones in conjunction with center lines and traffic lane markings

Pavement edges

Turning limits and streetcar clearance at turns

Boundaries of pedestrian crosswalks

Limit lines to designate where vehicles shall stop for stop signs or traffic signals

Approach to an obstacle or reduced roadway width

Change from two-way to one-way street
Boundaries of safety zones
Parking limits and stalls

- (2) Wide highways are usually divided by painted stripes to separate the various lanes of travel. The driver should never drive with the left wheel on or to the left of the center line, except when he is overtaking and passing another vehicle. The driver should make a habit of keeping the car in a position about midway between stripes on multi-laned highways and to the right of the center-line stripe on two-lane highways. Vehicles should not straddle lane lines or center lines.

c. Traffic Signals

- (1) Traffic signals include all power-operated devices using light, by which traffic is warned or is directed to take specific action. Thus they are distinguished from illuminated or reflecting signs. There are two types, traffic control signals and flashing signals.
- (2) The law for the observance of traffic-control devices states:

Subd. 4. No driver of a vehicle or motorman of a streetcar or pedestrian, or person riding an animal or bicycle, shall disobey the instructions of any official traffic-control device placed in accordance with the provisions of this chapter, unless at the time otherwise directed by a police officer.

Subd. 5. When traffic is controlled by traffic-control signals exhibiting the words, "Go," "Caution," or "Stop," or exhibiting different colored lights successively one at a time, the following colors only shall be used, which terms and lights shall indicate as follows:

(a) Green alone, or "Go."

1'. Vehicular traffic facing the signal may proceed straight through or turn right or left unless a sign at such place prohibits either such turn; vehicular traffic shall yield the right of way to other vehicles and to pedestrians lawfully within the intersection at the time such signal is exhibited;

2'. Pedestrians facing the signal may proceed across the roadway within any marked or unmarked crosswalk;

(b) Yellow alone, or "Caution," when shown following the green or "Go" signal.

- 1'. Vehicular traffic facing the signal shall stop before entering the nearest crosswalk at the intersection, but vehicles within the intersection may be driven cautiously through the intersection;
- 2'. Pedestrians facing such signal are thereby advised that there is insufficient time to cross the roadway, and any pedestrian then starting to cross shall yield the right of way to all vehicles.

(c) Red alone, or "Stop."

- 1'. Vehicular traffic facing the signal shall stop before entering the nearest crosswalk at an intersection or at such other point as may be indicated by a clearly visible line, and shall remain standing until green or "Go" is shown alone;
- 2'. No pedestrian facing such signal shall enter the roadway unless he can do so safely and without interfering with any vehicular traffic.

(d) Red with green arrow.

- 1'. Vehicular traffic facing such signal may cautiously enter the intersection only to make the movement indicated by such arrow, but shall not interfere with other traffic or endanger pedestrians lawfully within a crosswalk;
- 2'. No pedestrian facing such signal shall enter the roadway unless he can do so safely and without interfering with any vehicular traffic.

(e)

Subd. 6. When flashing red or yellow signals are used they shall require obedience by vehicular traffic, as follows:

(a) Flashing red (stop signal)—

When a red lens is illuminated by rapid intermittent flashes, drivers of vehicles shall stop before entering the nearest crosswalk at an intersection or at a limit line when marked, and the right to proceed shall be subject to the rules applicable after making a stop at a stop sign;

(b) Flashing yellow (caution signal)—

When a yellow lens is illuminated with rapid intermittent flashes, drivers of vehicles may proceed through the intersection or past such signal only with caution.¹

C. How have the highways been improved to promote safe driving?

1. When the colonists began to move westward, the need for roads became apparent in this country. The Indian trails and water routes were no longer adequate. Private companies built the best roads in the early days and erected toll gates along the routes to collect exorbitant fees from the users of the roads.
2. When the migration westward swelled to great proportions, Congress appropriated funds to have a highway built that extended from Cumberland, Maryland, to Wheeling, West Virginia. This road which crossed the Appalachian Mountains was called the National Pike. Many other famous routes to the west were built in rapid succession, such as, the Santa Fe Trail, the Oregon Trail and the California Trail.
3. The appearance of the railway brought a sudden end to highway construction because travelers preferred the faster and more comfortable method of transportation provided by trains. The revival in the interest of better highways can be attributed to the popularity of the bicycle in the "Gay Nineties." The numerous cyclists organized clubs which were the nucleus of the "League of American Wheelmen." This league conducted a vigorous and successful campaign for the improvement of highways because the ruts, bumps and holes present in the old roads were dangerous and difficult for traveling.
4. The inferior quality of the roads became even more apparent when the new motor car appeared. As motor traffic increased, it was evident that an entirely new highway system would have to be built in the United States—highways on which people could drive in greater comfort and safety. As a result, there now are more than 3,250,000 miles of roadways in this country. Approximately 50 per cent of that number is improved highway and the rest is mainly dirt-surfaced.
5. Good highways are costly to build and maintain. The money to build and maintain both federal and state highways and local roads comes from taxes. Everyone purchasing a new car automatically pays a federal tax. Part of this tax money is divided among the states as federal aid for highway construction. The money is apportioned according to area, population and the number of miles of highway in each state. State trunk highways are financed through the following funds: The gasoline tax, the motor vehicle tax and federal aid. The other roads in the state are constructed and maintained by counties and towns, aided by distribution of one-third of the gasoline tax collected by the state.

6. Improved highways are usually those built of special materials to make a hard surface. The most commonly used materials are: Concrete, brick, macadam, and asphalt. Dirt roads that are covered with oiled gravel are sometimes considered improved highways.
7. The highway on which it would be impossible to have an accident has not been built as yet and may never be a reality. Engineers are ever at work to design new structures for the protection of the public. The main principles employed in modern highway construction are twofold: The separation of the lanes used by the opposing flow of traffic and the elimination of highway intersections by the use of the underpass, overpass and clover-leaf.
8. Engineers are convinced that the improvement of roadways through construction will help to improve traffic control. A brief list of additional suggestions for increasing driving safety follows:

Elimination of unnecessary curves.

Reduction of the size of hills.

Increase in the radius and width of curves.

Proper banking of curves.

Widening of the shoulders of the roads.

Provision for adequate drainage.

Increase in the width and number of lanes on highways.

Use of the rotary or traffic circle where more than two highways intersect.

Routing of highways around the business sections of cities and the main streets of small towns.

Provision of safety rails where special hazards are present.

Provision of uniform signs and signals along all streets and highways.

Special illumination of the highway for foggy or rainy weather.

Provision of suitable walks for pedestrians along rural roads.

Elimination of railroad grade crossings wherever possible.

Elimination of obstructions and distractions along the highways.

D. How can a map be helpful to the motorist?

1. Today it is possible to travel from city to city and from state to state on state and federal highways. Many of these highways are numbered. The numbers are used on maps for the convenience of the motorists to choose the shortest route and the best roads for a trip.

2. Every driver should understand how to read a map. The legend of a map will give information about classes of roads, road surfaces, mileage, route markers, places of interest, the location of county seats and sizes of cities. In regard to road surfaces, a heavy black line may indicate a paved road and a dotted line, a dirt road.
3. Road maps indicate state and county boundary lines, rivers, lakes, railroads, and interesting scenic and historical places. Maps may be obtained without cost at gasoline stations, automobile clubs, state highway departments and various civic organizations.
4. The route numbers of interstate highways appearing on the maps correspond with the numbers on the shield-shaped markers along highways. The state highway route numbers are marked on square signs.

UNIT XXXVI**HOW CAN DRIVERS, PEDESTRIANS AND
BICYCLISTS COOPERATE TO REDUCE
THE ACCIDENT TOLL?**

Suggested Time: Five Class Periods

OBJECTIVES

- To realize that cooperation between the driver and the pedestrian is needed to solve most of our accident problems.
- To develop an understanding of the responsibilities of bicyclists and pedestrians to promote better traffic conditions.
- To develop an appreciation of the school safety patrol.

SUGGESTED ACTIVITIES**Recognize the Problem**

- Study local ordinances to find out what laws protect pedestrians.
- Discuss: How motor bikes are subject to motor vehicle laws.

Develop the Problem

- Collect newspaper clippings regarding pedestrians, bicycle or auto accidents. Post on the bulletin board.
- Make and exhibit posters showing why automobile drivers and pedestrians should not drink alcoholic liquors or use narcotic drugs.
- Discuss the evils of hitchhiking. Why is hitchhiking unlawful?
- Find out the number of pedestrians and bicyclists killed annually.
- Publicize the valuable work of the school safety patrol. If a patrol does not exist in the school, present a plan for the establishment of one to the proper school authorities.

Evaluation

- List and describe in detail basic rules for pedestrian safety after observing pedestrian behavior of students on the streets around the school.
- Make out a bicycle safety code and distribute copies to all bicyclists.
- Discuss how the school safety patrol can assist pupils in safe travel to and from school.

TERMS AND CONCEPTS

- Alcohol, crosswalk, cyclist, discourtesy, indifference, fatigue, drowsiness, judgment, lack of attention, narcotics, pedestrian, school safety patrol, traffic-control signal.

SUGGESTED CONTENT

A. What is the annual pedestrian death toll?

1. The state law defines a pedestrian as any person afoot. This means everyone is a pedestrian every time he steps on a public street or highway.
2. The accompanying chart shows what practices, engaged in by pedestrians, were responsible for **13,600 deaths** and **265,000 injuries** in 1941.

PEDESTRIAN ACTIONS, MOTOR VEHICLE TRAFFIC ACCIDENTS,
1941

Actions	Killed			Injured		
	Total (Per Cent) (30 States)	Urban (Per Cent) (110 Cities)	Rural (Per Cent) (16 States)	Total (Per Cent) (29 States)	Urban (Per Cent) (110 Cities)	Rural (Per Cent) (16 States)
Total Pedestrians.....	100	100	100	100	100	100
Crossing at intersection.....	25	44	7	38	43	8
With signal	"	4	"	6	9	1
Against signal	5	10	"	11	12	"
No signal	17	27	6	18	20	6
Diagonally	3	3	1	3	2	1
Crossing between intersections	35	37	36	26	31	33
Coming from behind parked cars	8	5	6	15	9	10
Walking in roadway.....	19	4	34	4	2	26
With traffic—walks avail- able	5	....	3	1	....	2
With traffic—no sidewalks..	9	....	19	2	....	16
Against traffic—walks avail- able	1	....	1	1	....	1
Against traffic — no side- walks	4	....	11	"	....	7
Standing in safety zone.....	"	1	"	"	1	"
Getting on or off streetcar.....	"	1	"	1	1	"
Getting on or off vehicle.....	1	1	2	1	1	2
Working in roadway.....	3	2	5	2	2	8
Playing in roadway.....	5	2	3	9	7	6
Hitching on vehicle.....	1	1	1	1	1	1
Lying in roadway.....	1	"	2	"	"	"
Not in roadway	2	2	4	3	2	6

*Less than half of one per cent. (Accident Facts, 1941.) National Safety Council estimates based on reports of state and city traffic authorities.

3. The main violations leading to pedestrian accidents are as follows:
 - a. Crossing street in the middle of the block instead of at intersection.
 - b. Walking on the highway.
 - c. Crossing at intersection with no signal.
 - d. Crossing at intersection against a signal.
4. In every instance listed above, the pedestrian "commits" his own accident. Compare the national statistics with the pedestrian accident rate in the state of Minnesota in 1942:

THE MINNESOTA PEDESTRIAN TOLL

Pedestrians killed, NOT at intersections.....	93
Crossing road or street.....	35
Walking in roadway.....	35
Playing in roadway.....	12
Coming from behind parked cars.....	6
Lying or standing in roadway.....	5
Pedestrians killed, AT intersections.....	40
Crossing, no signal.....	29
Crossing diagonally	6
Crossing against signal.....	3
Crossing with signal.....	2
Miscellaneous traffic deaths.....	12
<hr/>	
Total	145

5. Two out of every 3 Minnesota pedestrians killed, actually walked to their deaths by violating traffic laws made for their own protection. Age and youth bear the brunt of the pedestrian death toll. The 1942 Minnesota figures are distributed in the following way:

Age Group	Deaths
5 or less.....	10
5-20	26
20-35	9
35-55	48
55 and over.....	52
<hr/>	
Total	145

B. What are the rights and duties of the pedestrian?

1. The pedestrian who values his life to any degree will make a habit of crossing a street only at the intersection. Drivers expect to find pedestrians crossing at intersections rather than in the middle of a block. Traffic signals and other equipment designed to help the pedestrian are located at the intersection so it is good sense to take advantage of this protection. The pedestrian must learn that his own reckless acts cause a majority of the pedestrian deaths and injuries. An injured pedestrian cannot expect to collect damages from a motorist if he, himself, is partially to blame for the accident. This is called contributory negligence. An example is, being struck while in the act of crossing against the red light.
2. The pedestrian should not cross an intersection if the signal exhibits a red or yellow light or displays the word "STOP" in his direction. He should wait on the curb until a green light or the words "GO" or "WALK" are shown. Even then he should be alert for motorists making right and left turns and for reckless drivers who "jump" the light. The wise pedestrian stays within the boundaries of the crosswalk and avoids diagonal crossing.
3. A pedestrian crossing a roadway at any point other than within the marked or unmarked crosswalk at an intersection must yield the right of way to all vehicles upon the roadway. The crosswalk is that portion of a roadway ordinarily included if the sidewalk were continued across the street; or any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface. A person who steps out on the street from behind a parked car in the middle of a block may be stepping directly into the path of an approaching automobile. If the automobile is traveling at the relatively slow speed of 20 miles an hour, the car will travel approximately 50 feet before coming to a complete stop. The pedestrian does not have much chance against a ton of steel.
4. The pedestrian must also yield the right of way to all vehicles upon the roadway if he crosses a roadway at a point where a pedestrian tunnel or overhead pedestrian crossing has been provided.
5. A pedestrian should look first to his left, then to his right before crossing a street. The reason for doing this is that the first vehicles encountered by the pedestrian will be traveling from the direction to the left. Pedestrians should use the right half of crosswalks so that the pedestrians crossing from the opposite side can use the left half, thus avoiding confusion and delay. Keep to the right on sidewalks and crosswalks.

6. The pedestrian should not act impulsively in front of motorists. Suddenly running or reversing direction is dangerous because it forces motorists to make split-second decisions. A better policy to follow when crossing a street is maintaining a steady, but cautious pace.
7. A common unsafe habit of many persons is alighting from or boarding an automobile in the path of moving traffic. By boarding and alighting from the right side or the curb side of a vehicle, this hazard can be eliminated.
8. The community should accept its responsibility for providing sufficient parks and playgrounds so that children need not play in the streets. Children with sleds should never coast on, into or across a street because the slippery road surface makes stopping impossible for either the coaster or driver. A similar caution applies to coaster wagons. Persons on roller skates likewise must take special precautions to avoid skating into the path of an automobile or falling when crossing a street.
9. A pedestrian should always wait on the curb or a safety island for a streetcar or bus to protect himself from being hit. Many serious accidents occur when pedestrians rush out into the street in a frantic effort to board a streetcar or when pedestrians, on alighting, cross the street in front of a bus or car. In both cases the motorist is given no warning of the impending danger. When leaving a bus or streetcar, a pedestrian should walk directly to the nearest curb after making sure that no vehicles are approaching from the right. The danger of attempting to board or alight from a moving vehicle is obvious. One slip would probably result in serious injury or death under the wheels of an onrushing vehicle.
10. No person shall stand in a roadway for the purpose of soliciting a ride from the driver of any private vehicle.¹ Drivers should realize that they are taking a chance by picking up hitchhikers along the highway because murders and robberies are sometimes committed by hitchhiking criminals. Drivers may be liable to pay hitchhikers to whom they give rides for any injuries that result from an accident. The hitchhikers risk their own lives by walking on the right side of the road. Persons who hitch rides on trucks and private motor vehicles are running the risk of falling in front of another moving vehicle.
11. The law prohibits the hitching of a toboggan, hand sled, bicycle, coaster wagon or other similar device onto any motor vehicle, streetcar, or trackless trolley car while being used on a highway.²

¹M. S. 1945, Sec. 169.22.

²M.S. 1945, Sec. 169.46.

12. Pedestrians when walking along a roadway shall walk near the left side of the roadway, giving way to oncoming traffic.¹ By facing the approaching traffic when no sidewalks or pedestrian lanes are provided, a pedestrian has a full view of the hazards and can seek a safe place at the extreme edge of the highway or on the shoulder of the road if necessary.
13. For night walking, a pedestrian should wear light-colored clothing or carry a light or reflector so that he can be seen quickly and at great distances. Light colors reflect light whereas dark colors absorb light.
14. Accident records show that a pedestrian or a driver who had been drinking was involved in 1 out of every 4 fatal accidents during 1944. A drunken pedestrian, as well as a drunken driver, is obviously a traffic hazard. Persons who are intoxicated cannot walk safely and cannot make intelligent, quick decisions if facing an emergency. Therefore, they should not be pedestrians.
15. The pedestrian and motorist should be cognizant of the special problems and dangers that arise from heavy traffic, bright lights, bad weather and poor conditions of the highway. When streets are icy and slippery, the pedestrian faces the danger of falling and the motorist has difficulty driving and stopping. Fog, mist, rain, snow and sleet reduce a driver's visibility. Open umbrellas and high coat collars obstruct the pedestrian's view.
16. The pedestrian who desires to be called a good citizen conforms to traffic rules and regulations. He remembers that courtesy pays for the pedestrian as well as for the driver. The pedestrian is just as responsible as the driver for preventing accidents.

C. What are the rights and duties of the bicyclist?

1. Statistics show that in 1941, 900 persons were killed in bicycle-motor vehicle accidents and 37,000 cyclists were injured. The ages 5-14 and 15-24 have the highest fatality. Further study reveals that a majority of all accidents were the direct result of carelessness on the part of the cyclist. For example: Improper riding, failure to give right of way, disregard for traffic rules and traffic signals, and riding defective bicycles.
2. The cyclist and the motorist are subject to the same traffic regulations. The bicycle rider of today, who obeys traffic laws, is alert to hazards and maintains a properly equipped bicycle, will be the safe and efficient automobile driver of tomorrow.
3. Every bicycle used on public roadways after dark must be equipped with a lamp on the front exhibiting a white light visible from a distance of at least 500 feet to the front, and

¹M. S. 1945, Sec. 169.21 (Subdivision 5).

with a lamp on the rear exhibiting a red light visible from a distance of 500 feet to the rear.¹ Instead of the rear light, a reflector, visible from 300 feet to the rear when in front of motor vehicle lamps, may be used.²

4. Some cities require the registration and licensing of bicycles. As evidence of registration, each bicycle is equipped with a metal license plate. This aids in the identification of the bicycle and cyclist in case of traffic violations or accidents. It also is a definite factor in reducing bicycle thefts and facilitates the recovery and return of stolen bicycles.
5. Before a license is issued for any bicycle, there should be an inspection of the machine to see if the mechanical condition meets adequate standards and if it possesses the essential safety equipment. Any deficiency should be corrected before the license is issued.
6. When a bicycle is equipped with a motor, it is considered a motor vehicle and is, therefore, subject to all motor vehicle laws of registration, licensing, and liability.
7. Like the pedestrian and the motorist, the cyclist must learn and conscientiously observe the common sense rules of the road in order to do his part in eliminating accidents to himself and others. A list of such rules follows:

BICYCLE SAFETY RULES

Observe every traffic law, sign and signal.

Ride single file.

Refuse to carry passengers or large packages.

Walk, do not ride, across busy intersections.

Make all bicycle repairs off the road.

Do not stop or park on paved portion of the highway.

Come to a full stop before entering main streets and highways.

Do not ride out from between parked cars.

Do not weave in and out of traffic.

Never "hitch" rides nor ride too closely behind any vehicle.

Do not allow others to hitch on your bicycle.

Keep to the right side of the road.

Keep both hands on handlebars except to signal a turn or stop.

Pass another vehicle only after you see that the way ahead is clear.

Never pass a vehicle on a hill, curve or road intersection.

Adjust speed to the conditions of the road.

Hold left arm straight out to signal left turn.

Hold left arm out and up to signal right turn.

¹M. S. 1945, Sec. 169.54.

²M. S. 1945, Sec. 169.50.

Hold left arm out and down to signal slow or stop.
Have bicycle seat adjusted to fit comfortably.
Keep brakes in good working order at all times.
Have steering apparatus checked frequently.
Have a headlight and rear lamp or reflector for night riding.
Carry parcels only in an approved rack or carrier.
Refuse to accept dares or to take foolish chances.
Equip bicycle with a bell or other warning device.
Make left turns from the inside traffic lane.
Give the right of way to pedestrians and automobiles.
Avoid crowded or rough streets.
Do not squeeze between two moving vehicles.
Park bicycles in designated places.
Use guard clip on trousers or slacks.
Do not ride when tired or ill.
Ride on bicycle paths whenever provided.
Do not ride in bad or stormy weather.
Use caution when emerging from alley or driveway.
Wear light-colored clothing when riding at night.
Turn only at street corners.
Obey all local traffic ordinances.
Be a good sport; ride with caution and courtesy.

- 1). How does the school safety patrol help to reduce the accident toll?
 1. The school safety patrol assists and directs school children when crossing streets or highways at or near schools so that the crossing may be made without accident and with as little inconvenience to drivers as possible. They may also assume various types of patrol duties in the school building during assembly and fire drills, on the playground, and on school buses.
 2. School bus patrols have proven to be very effective in assisting the bus driver in maintaining discipline, directing pupils across the road, and signaling buses across railroad tracks.
 3. To be successful, the school safety patrol must have the respect and cooperation of the entire student body. All pupils should be made familiar with the valuable work of the school safety patrol.

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AGENCIES WHICH DISTRIBUTE FREE AND INEXPENSIVE MATERIALS OR VISUAL AIDS IN HEALTH AND SAFETY EDUCATION

Note: In ordering materials or in contacting agencies or commercial concerns relative to free and inexpensive materials or visual aids the following suggestions will be helpful.

The teacher or **one** member of the class should write on the school's letterhead so as to indicate the approval of the project by the school. If possible, letters should be typed.

Make the request specific according to the needs of the class. Never "fish" with a "Please send me everything on public health" type of request. A clear statement should be made concerning the material desired. If one does not know what material the agency or concern has, ask for a list of the available material as well as prices so that the supply needed may be ordered.

State clearly for what purpose the material is to be used and how many copies are needed for distribution to pupils in the class.

Exhaust local sources of information before going to state and national sources.

Allow sufficient time for an interchange of letters and shipping of materials. Normally a teacher should plan to allow for about a two months' interval between the time negotiations are opened and the final receipt of the material. It is true that most material will arrive more rapidly, but in order to be on the safe side be sure to allow sufficient time. It is advisable to make requests early in the school year.

It is suggested that a file be established for all free and inexpensive material. When ordering material, the needs for all health classes should be included so as not to confuse the agency or business concern which is supplying the material.

In surveying possible sources for films to be used in conjunction with teaching the units in the course of study, the University of Minnesota, Minnesota Department of Health, Minnesota Public Health Association, Minnesota Safety Council and the Minnesota Department of Highways may be contacted relative to films which they may have available either free or at a small charge.

Aetna Life Insurance Company, 151 Farmington Ave., Hartford, Connecticut.

American Association for Health, Physical Education, and Recreation, 1201 Sixteenth St., N.W., Washington 6, D. C.

American Automobile Association, Pennsylvania Ave. at 17th St., Washington 6, D. C.

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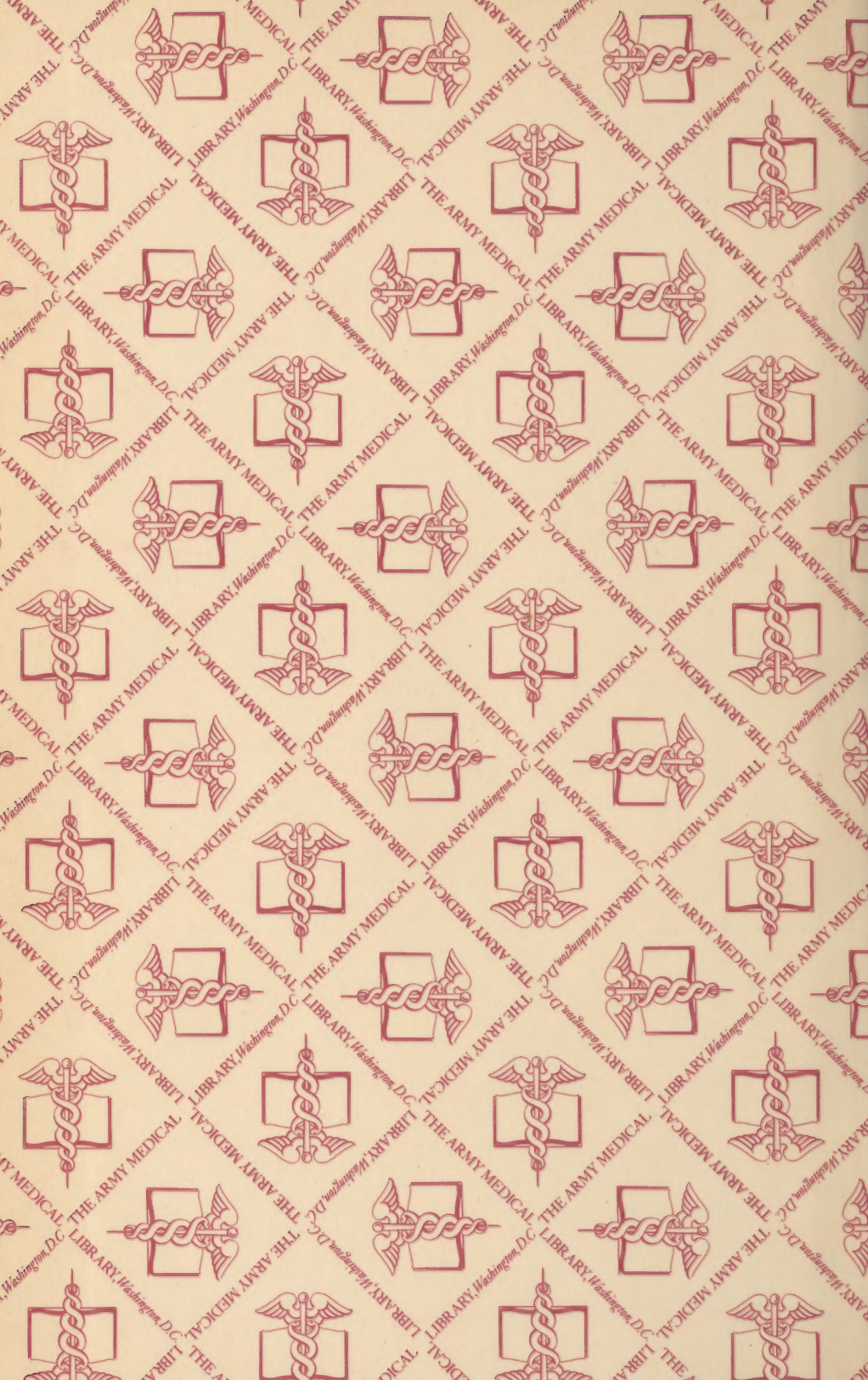
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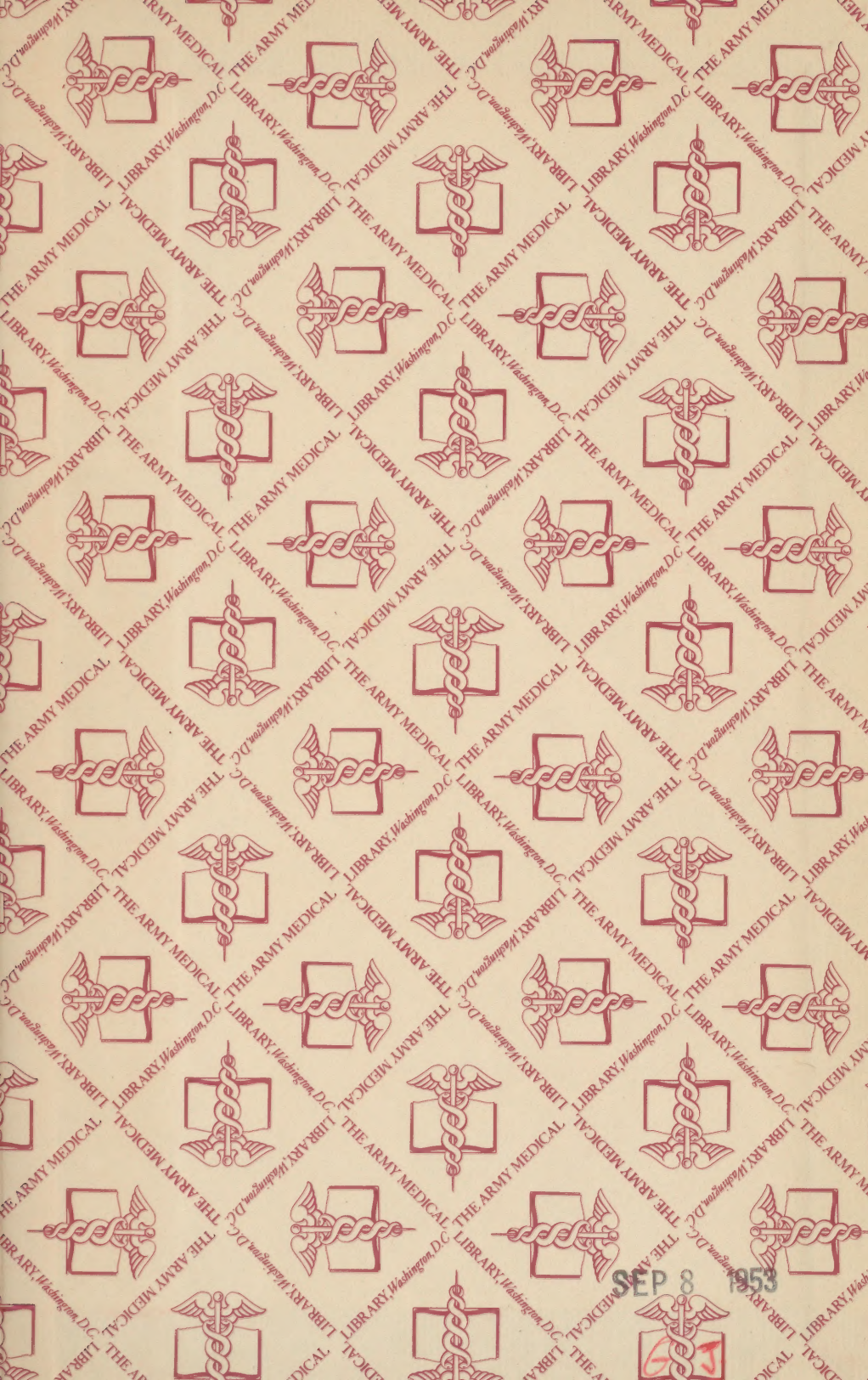
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- Cycle Trades of America, Chanin Building, New York, New York.
- Duluth Children's Museum and Art Center, 1832 E. Second St., Duluth 5, Minnesota.
- Employers Mutual, Accident Prevention Department, Wausau, Wisconsin.
- Evaporated Milk Association, 307 N. Michigan Ave., Chicago 1, Illinois.
- Film Preview, 1504 Hennepin Ave., Minneapolis 3, Minnesota.
- General Electric Co., Illuminating Laboratory, 1 River Road, Schenectady, New York.
- General Mills, Inc., Educational Relations, Department of Public Services, Minneapolis 15, Minnesota.
- General Motors Corp., Department of Public Relations, Detroit, Michigan.

- Girl Scouts, Inc., 14 W. 49th St., New York, New York.
- Good Housekeeping Institute, 57th St. and 8th Ave., New York, New York.
- Institute of Makers of Explosives, 103 Park Ave., New York, New York.
- International Association of Electrical Inspectors, Public Relations Committee, 85 John St., New York, New York.
- International Harvester, 180 N. Michigan Ave., Chicago, Illinois.
- John Hancock Mutual Life Insurance Company, Life Conservation Service, Post Office Box 111, Back Bay Station, Boston 17, Massachusetts.
- Julius Rosenwald Fund, 4901 S. Ellis, Chicago 15, Illinois.
- Kiwanis International, 520 N. Michigan Ave., Chicago, Illinois.
- Lumbermen's Mutual Casualty Company, Mutual Insurance Building, Chicago, Illinois.
- Metropolitan Life Insurance Company, Welfare Division, 1 Madison Ave., New York 10, New York.
- McKnight and McKnight, Bloomington, Illinois.
- Minnesota Cancer Society, Inc., 362 Lowry Bldg., St. Paul 2, Minnesota.
- Minnesota Department of Agriculture, 515 State Office Bldg., St. Paul 1, Minnesota.
- Minnesota Department of Conservation, 619 State Office Bldg., St. Paul 1, Minnesota.
- Minnesota Department of Education, 301 State Office Bldg., St. Paul 1, Minnesota.
- Minnesota Department of Health
- Divisions of Administration, Health Services, and Vital Statistics, 469 State Office Bldg., St. Paul 1, Minnesota.
 - Divisions of Child Hygiene, Dental Health, Industrial Health, Preventable Diseases, Public Health Nursing, and Sanitation, University Campus, Minneapolis 14, Minnesota.
- Minnesota Department of Highways, 1279 University Ave., St. Paul 4, Minnesota.
- Minnesota Department of Social Security, 600 Globe Bldg., St. Paul 1, Minnesota.
- Minnesota Education Association, 2651 University Ave., St. Paul 4, Minnesota.
- Minnesota Public Health Association, 11 W. Summit Ave., St. Paul 2, Minnesota.
- Minnesota Safety Council, 227 St. Paul Hotel, St. Paul 2, Minnesota.
- Minnesota Society for the Prevention of Blindness, 610 Hamm Bldg., St. Paul 1, Minnesota.
- Minnesota State Nutrition Council. Chairman: Mrs. Winifred H. Erickson, dietician, Ancker Hospital, St. Paul, Minnesota.
- National Board of Fire Underwriters, 85 John St., New York, New York.
- National Child Welfare Association, 70 Fifth Ave., New York, New York.
- National Committee for Mental Hygiene, Inc., 1790 Broadway, New York, New York.
- National Congress of Parents and Teachers, 600 S. Michigan Blvd., Chicago, Illinois.
- National Conservation Bureau, 60 John St., New York, New York.

- National Dairy Council, 111 N. Canal St., Chicago 6, Illinois.
- National Dental Hygiene Association, 934 Shoreham Bldg., Washington 5, D. C.
- National Education Association, 1201 Sixteenth St., N.W., Washington 6, D. C.
- National Fire Protection Association, 60 Batterymarch St., Boston, Massachusetts.
- National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.
- National Organization for Public Health Nursing, 1790 Broadway, New York 19, New York.
- National Research Council, Food and Nutrition Board, 2101 Constitution Ave., Washington, D. C.
- National Rifle Association of America, 1600 Rhode Island Ave., Washington, D. C.
- National Safety Council, Inc., 20 N. Wacker Drive, Chicago, Illinois.
- National Society for the Prevention of Blindness, 1790 Broadway, New York 19, New York.
- National Tuberculosis Association, 1790 Broadway, New York 19, New York.
- National Womens Christian Temperance Union, 1730 Chicago Ave., Evanston, Illinois.
- New York University, Center for Safety Education, Washington Square North, New York, New York.
- Sporting Arms and Ammunition Manufacturers Institute, 343 Lexington Ave., New York, New York.
- Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
- Travelers Insurance Company, Hartford, Connecticut.
- U. S. Bureau of Narcotics. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- U. S. Department of Agriculture, Bureau of Human Nutrition and Home Economics. Forest Service. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- U. S. Department of Interior. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- U. S. Department of Labor, Children's Bureau. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- U. S. Office of Education, Federal Security Agency. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- U. S. Public Health Service, Federal Security Agency. Bulletins for sale by Superintendent of Documents, Washington 25, D. C.
- United Temperance Movement, 622 Hodgson Bldg., Minneapolis, Minnesota.
- University of Indiana, Extension Bureau, Bloomington, Indiana.
- University of Minnesota, Bureau of Audio-Visual Instruction, Minneapolis 14, Minnesota.
- University of Wisconsin, Bureau of Visual Instruction, Madison 6, Wisconsin.





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